ORDER NO. SD7708-1259

Service Manual

QUARTZ Synthesizer

Direct Drive Automatic Turntable System

SL-1300MK2A (X)
SL-1300MK2 (E, XAL, XG, XGF)
SL-1310MK2 (E, XG)
SL-1300MK2A (E)
SL-1310MK2A (XG, E)

- The model SL-1300MK2A (X) is available in Asia, Latin America, Middle East and Africa only.
- The model SL-1300MK2 (E) is available in Scandinavia and Switzerland only.
- The model SL-1300MK2 (XAL) is available in Australia only.
- The model SL-1300MK2 (XG) is available in European only.
- The model SL-1300MK2 (XGF) is available in France only.
- The model SL-1300MK2A (E) is available in Scandinavia and Switzerland only.
- The model SL-1310MK2 (E) is available in Scandinavia and Switzerland only.
- The model SL-1310MK2 (XG) is available in European only.
- The model SL-1310MK2A (XG) is available in European only.
- The model SL-1310MK2A (E) is available in Scandinavia and Switzerland only.
- SL-1300MK2 is of silver finish.
- SL-1300MK2 is of black finish.

SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

General

Power supply	~110-120/220-240V, 50 or 60 Hz
Power consumption	14W
Dimensions (H x W x D)	14.5 x 45.3 x 38.4 cm (5-45/64 x 17-45/64 x 15-7/64 inches)
Weight	11.8 kg (26.0 lb)

Turntable section

Type	Quartz-phase-locked control direct drive automatic turntable with quartz synthesizer pitch control, Automatic start, Automatic return, Memo-repeat play and Manual play
Drive method	Direct Drive
Motor	Brushless DC motor
Drive control method	Quartz-phase-locked control
Turntable platter	Aluminum die-cast, diameter 33 cm (13"), weight 2.5 kg (5.5lb)
Moment of inertia	340 kg·cm^2 (116 lb·in^2)
Turntable speeds	33-1/3 and 45 r.p.m.
Turntable speed fine Adjustment	Adjustable up to ±9.9% in 0.1% increments by digital indication
Starting torque	1.5 kg·cm (1.3 lb·in)
Build-up characteristics	90° or 1/4 rotation to 33-1/3 rpm
Braking system	Electronic brake
Speed fluctuation due to load torque	0% within 1.5 kg·cm (1.3 lb·in)
Speed drift	Within 0.002%
Wow and flutter	0.025% WRMS (JIS C5521) ±0.035% weighted zero to peak (DIN 45507)
Rumble	−50 dB (DIN 45539A) −73 dB (DIN 45539B)

Tonearm section

Type	Gimbal suspended universal "S" shaped tubular arm, staticbalanced type
Effective length	230 mm (9-1/16")
Overhang	15 mm (19/32")
Tracking error angle	+3° at the outer groove of 30 cm (12") record +1° at the inner groove of 30 cm (12") record
Offset angle	21.5°
Effective mass	22 g (with a cartridge weighting 6.5 g at 1.25 g stylus pressure
Tonearm height adjustment	1 mm steps, a range of 6 mm
Adjustable stylus pressure range	0 ~ 3g
Cartridge weight range	5-11 g
Cartridge mounting dimensions	12.7 mm (1/2") mounting space
Headshell terminal lug	1.2 mm, for 4-pin terminal

Cartridge section

Model No.	EPC-205CIIL
Type	Moving Magnet Stereo Cartridge
Stylus arm	Titamium (Ti) tapered-tube, specially hard-treated
Frequency response	10 Hz to 25 kHz ±2 dB
Output voltage	2 mV at 1 kHz, 5 cm/sec zero to peak lateral velocity (4 mV at 1 kHz, 10 cm/sec zero to peak lateral velocity DIN 45500)
Channel separation	25 dB, at 1 kHz 20 dB, at 10 kHz
Channel balance	within 1 dB, at 1 kHz
DC resistance	30 ohms
Impedance	250 ohms, at 1 kHz
Inductance	40 mH
Compliance (dynamic)	12 x 10 $^{-6}$cm/dyne, at 100 Hz (CBS STR-100)
FIM distortion	0.6% (DIN 45500)
Stylus pressure	1.25±0.25 gram (12.5±2.5 mN)
Recommanded load resistance	10 K ohms to 1 M ohms
Recommended load capacitance	less than 500 pF
Stylus tip	0.2 x 0.7 mil (5 x 18μm) elliptical stylus, 0.15 mm square naked diamond
Weight	6.5 grams (cartridge only)
Mounting Dimension	Standard 1/2 inch mounting spacing
Terminals	1.2 mm diameter, 4 pin terminals
Replacement stylus	**EPS-205EX**

National Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

Allgemeine Daten

Stromversorgung	~ 110-120/220-240V, 50/60 Hz Wechselstrom
Leistungsaufnahme	14W
Abmessungen	14,5 x 45,3 x 38,4 cm (H x B x T)
Gewicht	11,8 kg

Plattenspieler

Typ	Quarzgesteuerter Direktantrieb-Automatik-Plattenspieler mit Quarz-Drehzahl-Feinregulierung, mit Start-automatik, Rückkehrautomatik, Abschaltautomatik, Memo-Repeat-Betrieb und manuellem Betrieb.
Antrieb	Direktantrieb
Motor	Kollektorloser Gleichstrommotor
Antriebsregel-Methode	Quarz-Steuerung QPL (Quartz-phase-locked)
Plattenteller	Aluminium-Spritzguß, 33 cmø
Trägheitsmoment	340 kg/cm²
Plattenteller-Drehzahlen	33-1/3 und 45 U/min
Plattenteller-Drehzahl-Feinregulierung	Regulierbar über einen Bereich von ±9,9% in Stufen von 0,1%, mit Digital-Anzeige
Anlaufdrehmoment	1,5 kg/cm
Drehzahl-Hochlaufdauer	90° oder 1/4 Umdrehung bei 33-1/3 U/min
Bremssystem	Elektronische Bremse
Drehzahl-Schwankung Wegen Belastungs-Drehmoment	0% innerhalb 1,5 kg/cm
Drehzahl-Abweichung	Innerhalb 0,002%
Gleichlaufschwankungen	0,025% WRMS (JIS C5521) ±0,035% bewertet Null-zu-Spitze (DIN 45507)
Rumpel-Fremspannungsabstand	–50 dB (DIN 45539A)
Rumpel-Geräuschspannungsabstand	–73 dB (DIN 45539B)

Tonarm

Typ	S-förmiger Universal-Rohrtonarm, statisch ausbalanciert, mit Kardan-Aufhängung.
Effektive Länge	230 mm
Überhang	15 mm
Spurfehlwinkel	+3° bei der äußeren Rille einer 30 cm-Platte +1° bei der inneren Rille einer 30 cm-Platte
Kröpfungswinkel	21,5°
Lagerreibung	weniger als 7 mg (horizontal, vertikal)
Effektive Masse	22 g (mit einem Tonabnehmer von 6 g Gewicht bei 1,75 g Auflagedruck
Tonarmhöhe-Regelbereich	in Stufen von 1 mm über einen Bereich von 6 mm
Auflagedruck-Einstellbereich	9,5 g
Tonabnehmer-Gewichtbereich	5 – 11 g
Tonabnehmer-Einbaunorm	12,7 mm Einbauraum
Tonarmkopf-Steckerstifte	1,2 mmø, für 4-Stift-Kontakt

Tonabnehmer

Modell-Nummer	EPC-205CIIL
Typ	Magnet-Stereo-Tonabnehmer
Nadelträger	Konische Titan-(Ti) Röhre spezialgehärtet
Frequenzgang	10 Hz-25 kHz ±2 dB
Ausgangsspannung	2 mV bei 1 kHz, 5 cm/sec Null-zu-Spitze, lateral (4 mV bei 1 kHz, 10 cm/sec Null-zu-Spitze, lateral, DIN 45500)
Kanaltrennung	25 dB bei 1 kHz 20 dB bei 10 kHz
Kanalabweichung	innerhalb 1 dB bei 1 kHz
Gleichstromwiderstand	30Ω
Impedanz	250Ω bei 1 kHz
Induktanz	40 mH
Nachgiebigkeit (dynamisch)	12 x 10^{-6}cm/Dyn bei 100 Hz (CBS STR-100)
FIM-Verzerrung	0.6% (DIN 45500)
Auflagekraft	1.25±0.25 g (12.5±2.5 mN)
Empfohlener Belastungswiderstand	10 k Ohm-1 M Ohm
Empfohlende Belastungskapazität	weniger als 500 pF
Nadelspitze	0.2 x 0.7 Mil (5 x 18μm), elliptisch, über Quadrat von 0.15 mm Seitenlänge
Gewicht	6.5 g (ohne Tonarmkopf)
Montageabmessung	Standard 1.25 cm Montageabstand
Anschlüsse	1.2 mm ø, 4-Stift
Ersatznadel	EPS-205EX

CARACTERISTIQUES TECHNIQUES

Sujet à changement sans préaris.

Généralités

Alimentation	Alternatif 110-120/220-240V, 50 ou 60 Hz.
Consommation	14W.
Dimensions	14,5(H) x 45,3(L) x 38,4(P) cm.
Poids	11,8 kg.

Platine de lecture

Type	Platine automatique à entraînement direct à réglage d'accrochage de phase par quartz, avec réglage d'écart du synthétiseur à quartz; Démarrage automatique; Retour automatique; Arrêt automatique; Audition de mémoire répétée et Audition manuelle.
Systéme d'entraînement	Entraînement direct.
Moteur	Moteur C.C. sans balais.
Groupe de réglage	Réglage d'accrochage de phase par quartz.
Plateau de lecture	Aluminium matricié, diamétre 33 cm (13") poids 2,5 kg.
Moment d'inertie	340 kg.cm².
Vitesses de rotation	33-1/3 et 45 t/p.m.
Réglage précis de Vitesse du plateau	Réglable jusqu'à ±9,9% avec 1% d'inc 1% d'incréments par indication numérique.
Couple de démarrage	1,5 kg.cm.
Caractéristiques d'augmentation	90° ou 1/4 de rotation à 33-1/3 t/p.m.
Systéme de freinage	Frein électronique.
Variation de vitesse dûe au couple de charge	0% en deçà de 1,5 kg.cm.
Déviation du nombre de tours	En deçà de 0,002%.
Pleurage et vibrato	0,025% de valeur efficace (JIS C5521), ±0,035% pondéré de zéro à la crête. (DIN 45507).
Ronflement	–50 dB (DIN 45539A). –73 dB (DIN 45539B).

Bras de lecture

Type	Bras tubulaire universel en forme de "S" suspendu à la cardan, de type à équilibrage statique.
Longueur effective	230 mm.
Surplomb	15 mm.
Angle d'erreur de synchronisme	+3° au sillon extérieur d'un disque de 30 cm (12").
	+1° au sillon intérieur d'un disque de 30 cm (12").
Angle de décalage	21,5°.
Frottement	Moins de 7 mg (latéral et vertical).
Masse réelle	22 g (avec une cellule de lecture pesant 6 gr, à une pression d'appui vertical de 1,75 gr.).
Réglage de la hauteur du bras de lecture	Plage de 6 mm par étapes de 1 mm.
Plage de pression réglable de la pointe de lecture	9,5 g.
Gamme du poids de la cellule de lecture	5-11 g.
Dimensions de l'assemblage de la cellule de lecture	Ecart d'agencement de 12,7 mm.
Pièce polaire de la coque porte-cellule	1,2 mm, pour une borne à broche tétrapolaire.

Cellule pick-up

Modèle No.	EPC-205CIIL
Type	Cellule Magnétique mobile Stéréo
Stylet	Tube conique en titane, spécialement traité.
Réponse en fréquence	10 Hz à 25 kHz ±2 dB
Tension de sortie	2 mV à 1 kHz, 5 cm/sec zéro à crête latérale (4 mV à 1 kHz, 10 cm/sec zéro à crête latérale. DIN 45500)
Séparation de canal	25 dB, à 1 kHz 20 dB à 10 kHz
Balance de canal	moins de 1 dB, à 1 kHz
Résistance C.C.	30 ohms
Impédance	250 ohms, à 1 kHz
Inductance	40 mH
Elasticité (dynamique)	12 x 10^{-6}cm/dyne, à 100 Hz (CBS STR-100)
Distorsion FIM	0.6% (DIN 45500)
Pression de la pointe de lecture	1,25±0,25 gramme (12,5±2,5 mN)
Résistance de charge recommandée	10 k ohms à 1 M ohms
Capacité de charge recommandée	inférieure à 500 pF
Entrémité de la pointe de lecture	Diamant nu, carré de 0,15 mm, forme ellipsoïdale de 0,2 x 0,7 mil.(5 x 18μm).
Poids	6,5 grammes (cellule seule)
Dimensions de montage	Espacement de montage standard de 1,2 cm
Bornes	4 bornes de 1,2 mm de diamètre
Pointe de lecture de remplacement	EPS-205EX

■ FEATURES

Encounter two separate isolation stages. The first stage effectively damps out harmful external vibrations which may reach the unit through its resting surface. The all-important turntable, motor and tonearm assembly are then supported on a second isolation system. These isolators are specially designed with material and springs of calculated, finely-tuned elasticity to absorb external vibrations.
Isolation from feedback lets you enjoy clear, transparent sound even at high volume levels.

Technics unique motor construction in which the rotor of the motor is integrally formed with the turntable.

High torque motor delivering 1.5kg·cm makes it possible to reach 33-1/3 r.p.m. from standstill within 0.7 sec. (1/4 rotation) and to effect instantaneous speed change. (Fig. 1).

Superior load characteristic of 0 rotational deviation even at a stylus pressure of 300 g. (Fig. 2).

High performance with wow and flutter of only 0.025% (JIS C5521) and rumble of –73 dB (DIN 45539B).
Since the development of the DD turntable, Technics has continually strived for further improvement of player performance and has introduced numerous high performance models on the market.
The SL-1300MK2 series is brought into being by combination of experience and research.
The characteristic values of rumble –73 dB (DIN 45539B) and wow and flutter of 0.025% (W.R.M.S JIS C5521) by far exceed the standards to which record albums are made.

Quartz Controlled Rotation Accuracy
The SL-1300MK2 utilizes the oscillation of a quartz crystal as a reference signal or source. This oscillation is not affected by temperature change or power fluctuations. By synchronizing the rotation of the turntable platter accurately to the reference signal, speed drift of the SL-1300MK2 is held within ±0.002%. This means that for a record with a playing time of 30 min, total playing time variation can amount to no more than 0.036 sec. This stable and accurate rotation sets a new standard of precision.
The accuracy under controlled operating conditions as in a listening room is about ±0.00001% as shown in Fig. 3.

Highly sensitive universal tonearm.
For the finest tracking sensitivity, the tonearm rests in a gimbal suspension equipped with two pairs of low friction pivot bearings. Gimbal suspension and low tonearm mass means that accurate tracking is possible at tracking forces as low as 0.25 grams. With enhanced rotational sensitivity of 7 mg. the tonearm is allowed free, gyroscopic movement to ensure flawless balance during tracking. The longer-than-usual effective tonearm length (9-1/16" or 230 mm, stylus to pivot) contributes to the arm's low tracking error, and this in turn facilitates the design of the anti-skating control for precise and reliable tracking. With this design, a single precise anti-skating scale counteracts side thrust for all types of styli.

Arm height is adjustable within a range of 6 mm to accomodate varying cartridge dimensions.

Resonance dampened headshell with unique overhang adjuster.

Low capacitance phonocables.

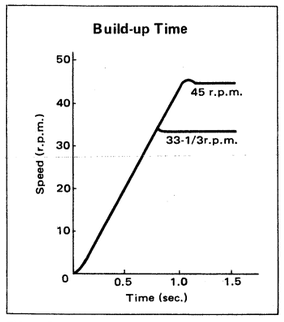


Fig. 1

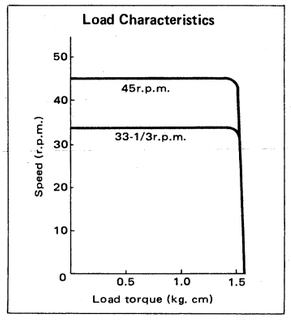


Fig. 2

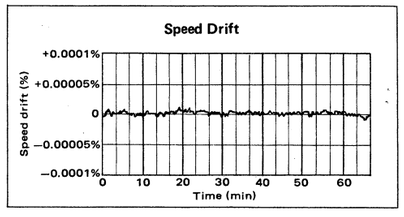


Fig. 3

■ CROSS SECTION OF MOTOR PORTION AND DOUBLE INSULATOR

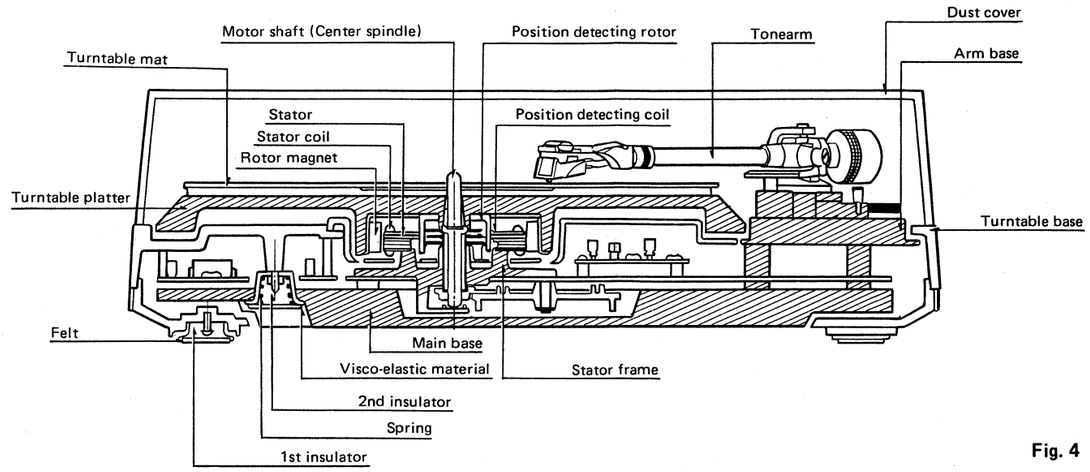


Fig. 4

■ PARTS IDENTIFICATION

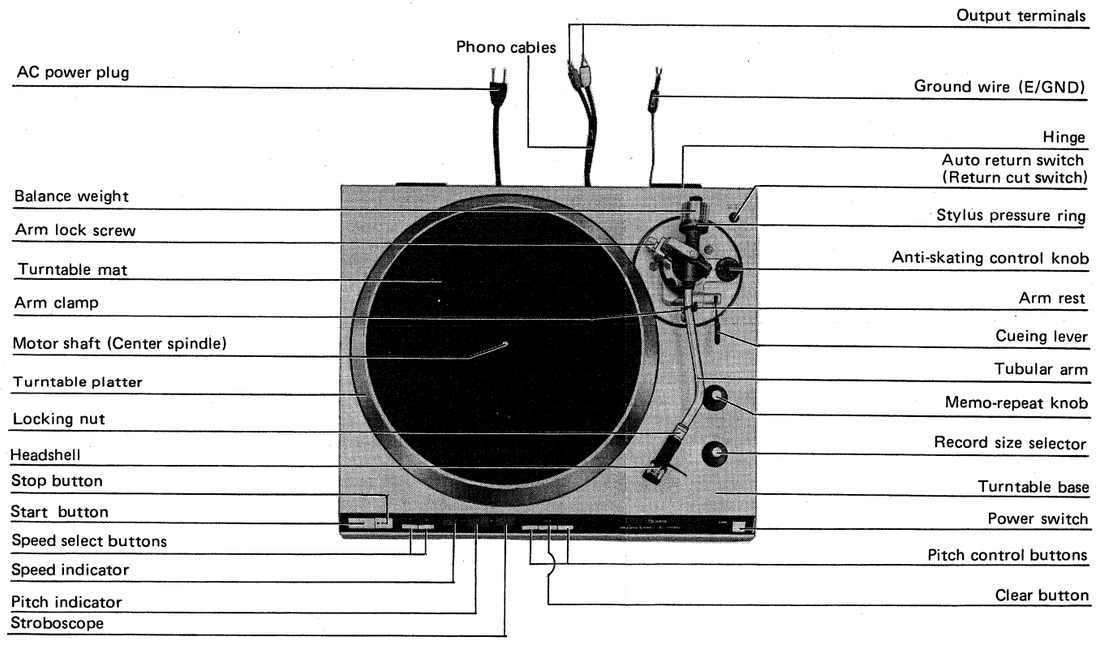


Fig. 5

■ TO REMOVE CABINET AND BOTTOM COVER

1. Remove headshell and balance weight.
2. Clamp tone arm to the arm rest.
3. Remove turntable platter.
4. Close dust cover.
5. Turn unit upside down taking special care not to damage or scratch the dust cover.
6. Remove the 7 screws from bottom cabinet (Fig. 6).
7. Remove the 4 screws from main base (Fig. 7).
8. Holding the player firmly with both hands, to prevent separation of upper section (turntable base) from lower section (main base), turn it carefully upwards.
9. Remove dust cover.
10. Remove the 6 screws from the panel cover (Fig. 8).
11. Unplug the 5 plug-in connectors and 1 cord clamp (Fig. 9).
12. To remove the turntable base from the main base bottom section, turn cueing lever upward (cueing position) and move tone arm towards center of spindle. Top section can be lifted up easily.
13. To reassemble, perform steps 1 through 12 in reverse.

Note:
The turntable horizontally to the panel face is already adjusted before shipment.
If deviated, correct it by means of the adjust screws using a 5 mm box spanner.

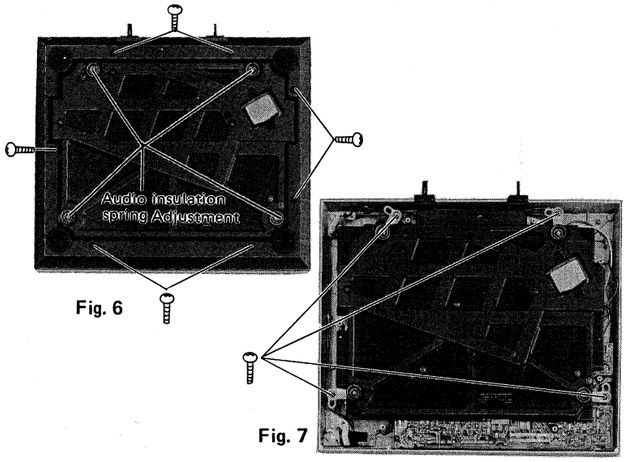


Fig. 6

Fig. 7

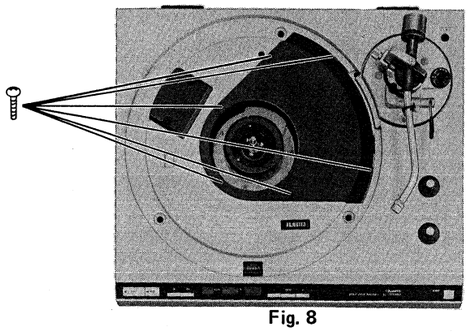


Fig. 8

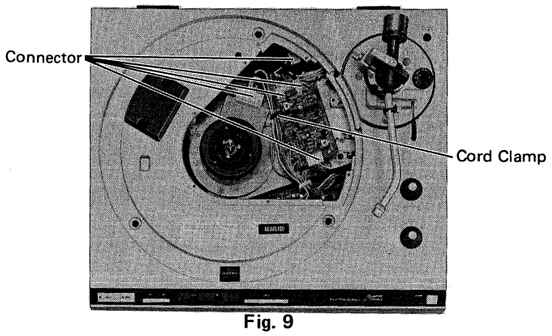
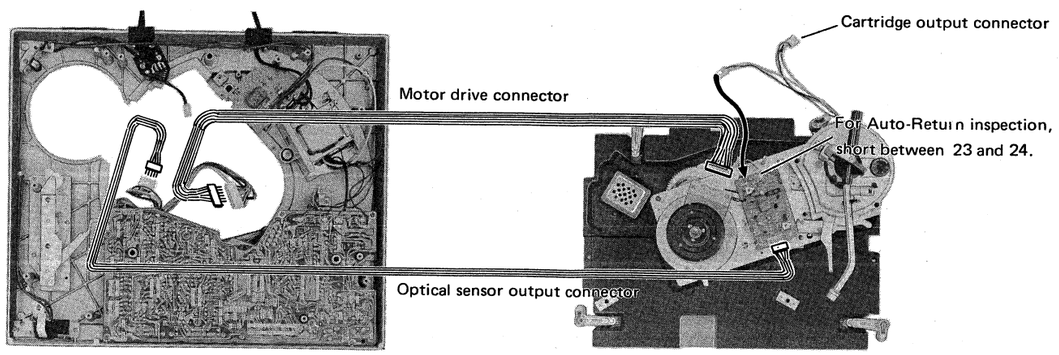


Fig. 9

■ CONNECTOR CONNECTION POINTS FOR INSPECTION

Connect the disassembled main unit and main base as shown in the Figure below.


Cartridge output connector
Motor drive connector
For Auto-Return inspection, short between 23 and 24.
Optical sensor output connector
Fig. 10

■ HOW TO PLAY

Manual play

Place a record on the turntable platter.
Push the 45 r.p.m. speed select button if you play a 45 r.p.m. record. (See Fig. 11).
Note:
Since the unit has been designed to select 33-1/3 r.p.m. automatically each time you push the power switch on, push the speed select button if you play a 45 r.p.m. record.

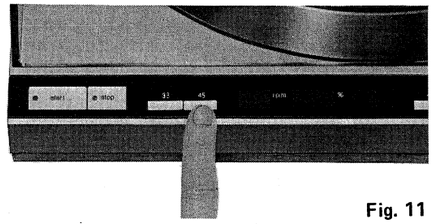


Fig. 11

Move the tonearm manually over the record, the turntable will start to rotate. Lower the cueing lever.
The tonearm will descend slowly onto the record and play will begin.

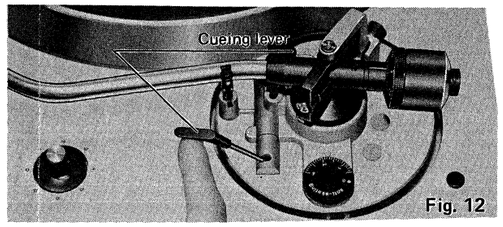


Fig. 12

When finished, the tonearm will automatically return to the arm rest (auto return) and the turntable platter will stop rotation.
Note:
- To shut the power off the power switch must be pushed again to the off (■).
- If the "memo-repeat" knob is in a position other than "0", play will be repeated by the number of time set, therefore, be sure to keep the "memo-repeat" knob in the "0" position.
- If you play a 45 r.p.m. record with a large center hole, use the furnished adaptor on the center spindle.

Automatic play

Push the power switch to the ON position (▬).
The speed indicator for 33-1/3 r.p.m. the pitch indicator and stroboscope will all light up.

Place a record on the turntable platter.

Release the arm clamp.
Remove the stylus cover if your cartridge has one.

Set the record size selector to the diameter of the record (7", 10" or 12") you wish to play.

Push the start button. (See Fig. 13).
The tonearm will move and descend according to the size selected and start play (Automatic start).

Fig. 13

When finished play, the tonearm will automatically return to the arm rest and the turntable platter will stop rotation.
Note:
- Records with dimensions other than 7" (17 cm), 10" (25 cm) and 12" (30 cm) diameter must be played "Manually".

Repeat play

This unit employs a unique feature the "Memo-repeat". You can play a record repeatedly from one to six times or continuously by setting this knob to the desired position.

Set the "memo-repeat" knob to the desired number you wish to play. (See Fig. 14).
"R" position enables you to repeat play continuously.

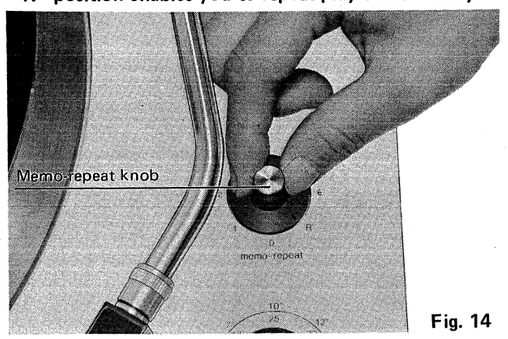


Fig. 14

Note:
For suspension of play, be sure to push the stop button after having set the "memo-repeat" knob to "0".

■ HOW TO USE AUTO RETURN SWITCH

This unit employs a unique "auto return switch" (return cut switch).

- Should any phono disc whose central hole is off center be played, the tonearm will automatically return during the course of performance. In such a case, set the auto return switch to the OFF (■) position (see Fig. 15), and then the phono disc can be played to the final groove.

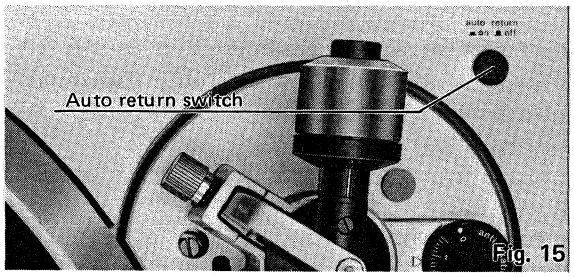


Fig. 15

Note:
For restoring the normal auto return function, set the switch back to the ON (▬) position.

■ HOW TO SUSPEND AND STOP PLAY

- For temporary suspension of play, raise the cueing lever, and the stylus tip of the cartridge, will lift from the record.
- For suspension of play, push the stop button.
  The tonearm automatically returns to the arm rest and the turntable stops rotating.

Note:
The stop button will light up after the tonearm returns to the arm rest.

■ ADJUSTMENTS-1

Adjustment of the arm height. (See Fig. 16, 17)

- This tonearm has been locked in the highest position before shipping from the factory, adjust the arm height according to your cartridge height.
- Loosen the arm lock screw. And push the arm pivot bearing support downward until the tonearm is paralled with the record surface.

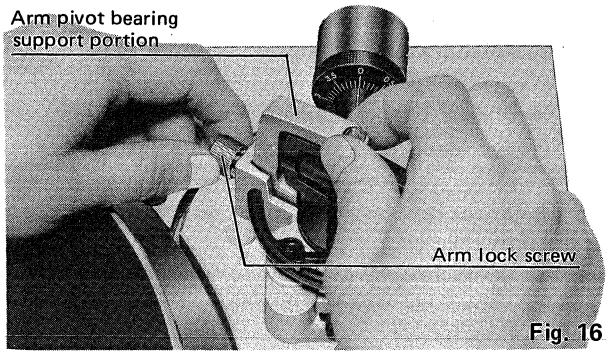


Fig. 16

- If the cartridge height is 18 mm as shown in the picture, lock the arm bearing support at the line indicated in the picture. (See Fig. 17) The arm height can be adjusted in 1 mm increments over a range of 6 mm.

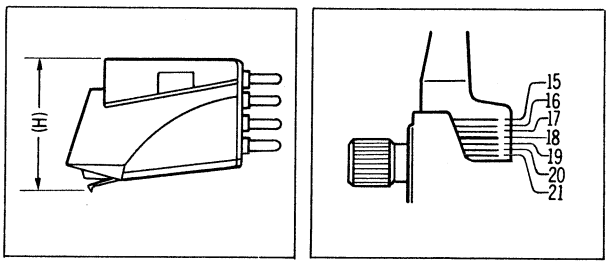


Fig. 17

■ ADJUSTMENTS-2

Pitch control (turntable speed fine adjustment)
By the employment of the Quartz Synthesizer pitch control for being employed for the first time in the world, a high degree of pitch control accuracy over a range as wide as ±9.9% in 0.1% increments can be obtained independently, with the quartz locked speed accuracy. Additionally, the pitch variations which are clearly indicated by the LED digital indicator provide you with accurate and easy selection.

- The pitch control can be selected in increments of 0.1% which is below the threshold of human perception. This function can be very effective for minor extension or reduction of broadcasting time in professional applications.

- The pitch control also enables you to accurately and precisely tune with musical instruments, and by varying the pitch slightly to obtaining a different musical note from phono disce.
  For a half tone change:
  +5.9% (#)
  –5.6% (b)
- Another feature of the variable pitch control over a wide range of ±9.9% is that it makes singing along with a melody easy for a choral or playing a phono disc for accompaniment only.
  By pressing the clear button which is located between the "+" and "–" pitch buttons, you can quickly return the set to normal playing speed.

Adjustment of the muting time and arm height.
(See Fig. 18 and 19)
This unit employs "muting switch" combination with arm lift to cut off the irritating noise when the stylus is set down on or lifted up from the record. You can adjust the muting time by adjusting the arm lift height (distance between the stylus tip and record surface when cueing lever is raised).
If the clearance becomes too narrow or too wide because of the physical size of the different cartridge on the market, turn the adjustment screw clockwise or counterclockwise, while pushing the arm lift down.
Clockwise rotation
– distance between the record and stylus tip is reduced, and muting time becomes longer.
Counterclockwise rotation
– distance between the record and stylus tip increases, and muting time becomes shorter.

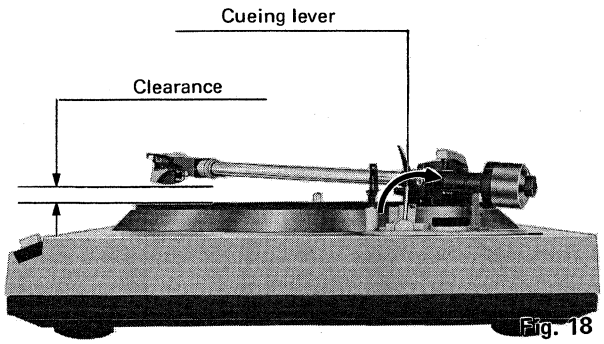


Fig. 18

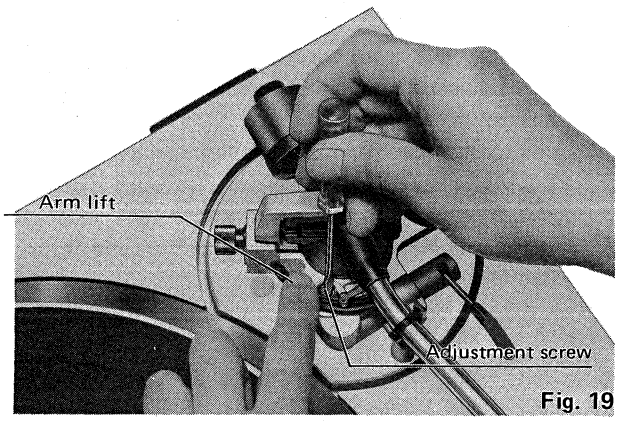


Fig. 19

Note:
As the adjusting screw has a hexagon head, be sure to make the adjustment while depressing the arm lift, and be sure that the hexagon head retract correctly into the arm lift when released.

Adjustment for automatic start and automatic return positions.
Should the tonearm not set down or lift off at the correct points, make adjustments according to the following procedures.

Adjustment for automatic start position (See Fig. 20).
1) Keep the power switch turned OFF (■) to prevent the turntable from rotation.
2) Remove the rubber cap.
In cases where the stylus tip sets down outside of the record.
– Move counterclockwise.
In cases where the stylus tip sets down on the recorded groove. -Move clockwise.

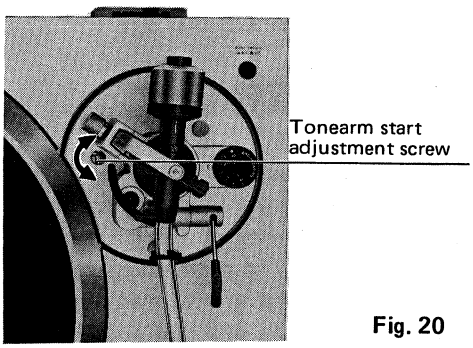


Fig. 20

Adjustment for automatic return position (See Fig. 21).
1) Keep the power switch turned OFF (■) to prevent the turntable from rotation.
2) Remove the rubber cap.
3) Move the tonearm toward the center spindle side, and make the adjustment by gradually turning the adjusting screw.
In cases where the tonearm tends to return before the playing has finished.
– Move counterclockwise.
In cases where the tonearm fails to return after the last groove of the record.
– Move clockwise.
Note:
Never turn the screw over a 180-degree angle.

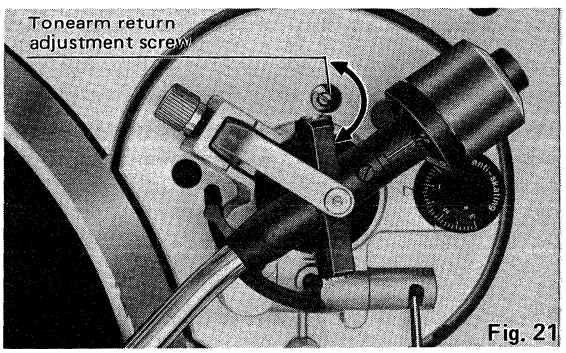


Fig. 21

■ JUSTIERUNGEN-1

Justierung der Tonarmhöhe (Fig. 16, 17)

- Dieser Tonarm ist vor der Auslieferung aus der Fabrik in seiner höchstmöglichen Position festgestellt worden. Justieren Sie die Tonarmhöhe entsprechend der Höhe des verwendeten Tonabnehmers.
- Lösen Sie die Tonarm-Verriegelungsschraube, und drücken Sie den Tonarm-Zapfenlagerträger soweit nach unten, bis der Tonarm waagrecht über der Schallplatte zu liegen kommt.
- Falls die Höhe des Tonabnehmers 18 mm beträgt, wie in der Abbildung gezeigt, verriegeln Sie den Zapfenlagerträger an der in der Abbildung gezeigten Linie (Fig. 17).
  Die Tonarmhöhe kann in Stufen von 1 mm über einen Bereich von 6 mm reguliert werden.

■ JUSTIERUNGEN-2

Drehzahl-Feinregulierung

Die Verwendung der Quarz-Synthesizer-Drehzahl-Feinregulierung-eine Weltneuheit im Plattenspielerbau–, erlaubt einen bisher unerreicht hohen Grad an Genauigkeit in der Drehzahl-Feinregulierung: unabhängige Regulierung in 0,1%-Stufen über einen Gesamtbereich von ±9,9%, dank der Quarz-gesteuerten Drehzahlpräzision. Und zur Vollendung der Bequemlichkeit in der Drehzahl-Feinabstimmung, kann die Abweichung jederzeit von der übersichtlichen LED-Digital-Anzeige abgelesen werden.

- Die Drehzahl-Feinregulierung kann in Stufen von 0,1% vorgenommen werden; einem Wert, der weit unter dem menschlichen Wahrnehmungsvermögen liegt. Diese Funktion ist äußerst wirkungsvoll für geringfügige Verlängerung oder Verkürzung der Sendezeit in Radio-Studios.
- Die Drehzahl-Feinregulierung gibt Ihnen außerdem die Möglichkeit, die Tonhöhe einer Schallplatte genau auf diejenige eines Musikinstrumentes abzustimmen oder die Tonhöhe leicht zu verändern, um von Schallplatten eine Musiknote zu erhalten.
  Für eine halbe Note: +5,9% (#)
  −5,6% (b)
- Ein weiterer Vorzug der über einen weiten Bereich von ±9,9% veränderlichen Tonregelung ist, daß sie das Mitsingen zu einer Melodie, oder das Abspielen einer Platte lediglich zur Begleitung so einfach macht.
  Durch Drücken der Lösch-Taste, die sich zwischen der "+" und der "−" Drehzahl-Feinregulierungs-Taste befindet, können Sie den Antrieb sofort auf die normale Drehzahl zurückstellen.

Einstellung der Tonarmlift höhe (Fig. 18 und 19).

Die Tonarmlifthöhe (der Abstand zwischen Nadelspitze und Schallplattenoberfläche, in Stellung "Hoch" des Lift-Hebels, ist vor der Auslieferung aus der Fabrik auf ungefähr 10 mm eingestellt worden.

Falls der Abstand zu klein oder zu groß wird, wenn ein Tonabnehmer von anderen Abmessungen verwendet wird, drehen Sie die Justierschraube im Uhrzeigersinn oder im Gegenuhrzeigersinn, währenddem Sie den Tonarmliftarm niederdrücken.

In diesem Plattenspieler ist die Funktion des "Dämpfungsschalters" mit dem Tonarmlift gekoppelt, damit störende Geräusche beim Absenken der Abtastnadel auf die Schallplatte oder beim Abheben eliminiert werden. Sie können die Dämpfungsdauer durch Regulieren der Tonarmlifthöhe verlängern oder verkürzen.

Drehung im Uhrzeigersinn

—Der Abstand zwischen der Schallplatte und der Abtastnadel wird verkleinert, und die Dämpfungszeit wird länger.

Drehung im Gegenuhrzeigersinn

—Der Abstand zwischen der Schallplatte und der Abtastnadel wird vergrößert, und die Dämpfungszeit wird kürzer.

Bemerkung:

Da die Justierschraube einen Sechskantkopf hat, muß der Tonarmliftarm während dem Justieren unbedingt gedrückt gehalten werden. Vergewissern Sie sich daß der Sechskantkopf in den Tonarmliftarm zurückkehrt wenn dieser losgelassen wird.

Einstellung des Aufsetzpunktes und des Abschaltpunktes der Tonarm-Automatik

Falls der Tonarm nicht an der korrekten Stelle abgesenkt oder abgehoben wird, so nehmen Sie die nötige Justierung auf folgende Weise vor:

Einstellung des Tonarmaufsetzpunktes der Automatik (Fig. 20)

1) Lassen Sie den Netzschalter in der OFF-Position (■), damit sich der Plattenteller nicht dreht.
2) Entfernen Sie die Gummikappe.

Falls der Aufsetzpunkt außerhalb der Platte liegt.

—Drehen Sie im Gegenuhrzeigersinn.

Falls der Aufsetzpunkt im Wiedergabteil der Schallplatte liegt.

—Drehen Sie im Uhrzeigersinn.

Einstellung des Abschaltpunktes der Automatik (Fig. 21)

1) Lassen Sie den Netzschalter in der OFF-Position (■), damit sich der Plattenteller nicht dreht.
2) Entfernen Sie die Gummikappe.
3) Führen Sie den Tonarm gegen die Plattentellerachse, und justieren Sie den Abschaltpunkt, indem Sie die Schraube stufenweise drehen.

Falls der Tonarm zu früh zurückkehrt.

—Drehen Sie im Gegenuhrzeigersinn.

Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.

—Drehen Sie im Uhrzeigersinn.

■ REGLAGES-1

Réglage de la hauteur du brass (Voir Fig.s 16, 17)

- Ce bras de lecture a été bloqué à la position la plus élevée, avant d'être expédié de l'usine. Régler la hauteur du bras selon la hauteur de la cellule pick-up utiliseé.
- Desserrer la vis de blocage du bras et pousser le support à pivot du bras vers le bas, jusqu'à ce que le bras de lecture soit parallèle à la surface du disque.
- Si la hauteur de la cellule de lecture est de 18 mm, comme montré sur l'illustration, bloquer le support à pivot du bras à la ligne indiquée sur l'illustation. (Voir Fig. 17)
  La hauteur du bras peut être réglée par augmentation d'1 mm, sur une marge de 6 mm.

■ REGLAGES-2

Commande d'écart (réglage précis de la vitesse du plateau).

En utilisant la commande d'écart de synthétiseur à quartz employée pour la première fois au monde, un degré élevé de précision de la commande d'écart de vitesse pouvant aller au-delà d'une plege aussi étenduè que ±9,9% dans des incréments de 0,1%, peut être indépendamment obtenu, avec une précision élevée de la vitesse bloquée par le quartz. De plus, les variations d'écart qui sont clairement indiquées par l'indicateur numérique à diode électro-luminescente vous permettent d'obtenir une sélection facile et précise.

- La commande de vitesse peut être influencée dans des incréments de 0,1%, ce qui est bien au-dessous du seuil de la perception humaine. Cette fonction est très efficace pour une diminution ou une réduction mineure de la durée d'émission, telle que dans les stations de radiodiffusion.
- La commande de vitesse vous permet aussi d'accorder avec précision et exactitude les instruments musicaux et de varier légèrement l'écart pour l'obtention d'une tonalité musicale à partir de disques phono.
  Pour une demi-étape:
  +5,9% (#)
  −5,6% (b)
- Une autre caractéristique du régulateur de tonalité, réglable au-delà d'une plage étendue de ±9,9%, est qu'il permet de chanter pour accompagner la mélodie d'un choeur ou pour l'audition d'un disque en accompagnement seul.
  En appuyant sur le bouton de libération, qui est situé entre les boutons d'écarts "+" et "−", vous pouvez rapidement faire revenir l'appareil à une vitesse de lecture normale.

Réglage de la hauteur de relevage du bras (Voir Figs. 18 et 19).

La hauteur de relevage du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque lorsque le levier de relevage du bras est soulevé) a été réglée en usine avant l'expédition, sur une valeur approximative de 10 mm (25/64").

Lorsque l'écart devient trop petit ou trop grand, à cause de la taille physique des diverses cellules que l'onpeut trouver sur le marché, tourner la vis de réglage dans le sens des aiguilles d'une montre ou en sens contraire, tout en poussant en même temps le souleveur du bras vers le bas.

Cet appareil utilise un "réglage d'amortissement" en combinaison avec le souleveur du bras, pour couper le bruit irritant provoqué lorsque la pointe de lecture est déposée ou soulevée du disque.

Vous pouvez régler la durée d'amortissement, en mettant au point la hauteur du souleveur du bras.

Sens des aiguilles d'une montre

—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue et la durée d'amortissement devient plus longue.

Sens contraire des aiguilles d'une montre

—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente et la durée d'amortissement devient plus courte.

Nota:

Comme la vis de réglage possède une tête hexagonale, s'assurer d'effectuer le réglage en appuyant sur le souleveur du bras et vérifier que la tête hexagonale se retire correctement dans le souleveur du bras quand il est libéré.

Réglages pour les positions de démarrage automatique et de retour automatique.

Dans le cas où le bras de lecture ne se déposerait pas ou ne se souléverait pas correctement, faire les mises au point nécessaires selon les procédures suivantes.

Mise au point pour une position de marche automatique (Voir Fig. 20)

1) Laisser l'interrupteur d'alimentation hors circuit (■), pour empêcher la rotation du plateau.
2) Retirer le capuchon en caoutchouc.

Dans le cas où la tête de la pointe de lecture s'abaisse en dehors du disque.

—Déplacer dans le sens contraire des aiguilles d'une montre.

Dans le cas où la tête de la pointe de lecture s'abaisse sur le sillon enregistré.

—Déplacer dans le sens des aiguilles d'une montre.

Mise au point pour une position de retour automatique (Voir Fig. 21).

1) Laisser l'interrupteur d'alimentation hors circuit (■), pour empêcher la rotation du plateau.
2) Retirer le capuchon en caiutchouc.
3) Déplacer le bras de lecture vers le côté du pivot central et faire la mise au point en tournant graduellement la vis de réglage.

Dans le cas où le bras de lecture tend à revenir avant que l'audition ne soit terminée.

—Déplacer dans le sens contraire des aiguilles d'une montre.

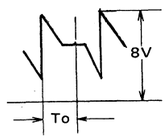
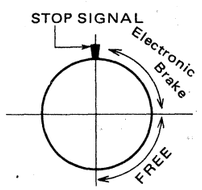
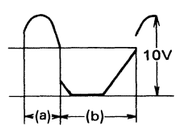
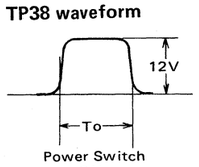
—Déplacer dans le sens des aiguilles d'une montre.

Dans le cas où le bras de lecture ne peut revenir en arrière, une fois achevé le dernier sillon du disque.

■ ADJUSTMENTS-3

Adjustment Points of Electrical System

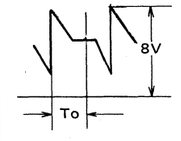
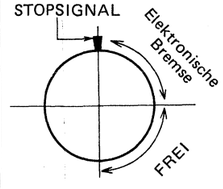
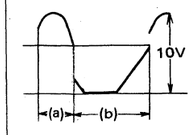
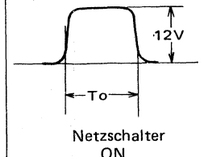
NOTE: Make the following adjustments after replacing parts such as IC's, transistors, diodes, etc.

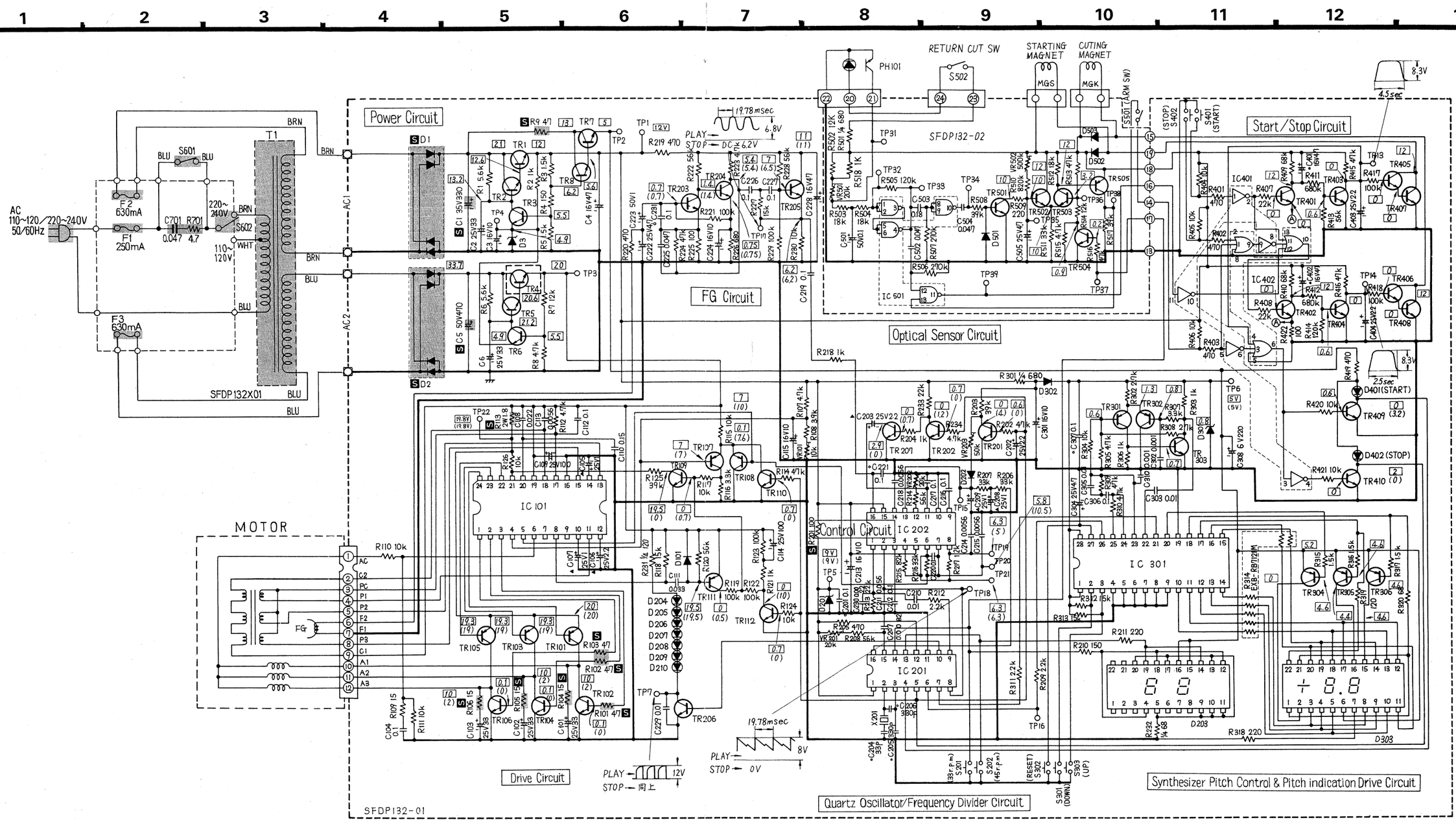
	Adjustment	Connection Points	Adjustment Point	Adjustment Method
A	Adjustment of standard voltage (VS)	DC voltmeter or Oscilloscope ⊕ → TP15 ⊖ → GROUND	**VR201**	Turn start switch on to begin turntable rotation. For 33 rpm . . . adjust VR201 for DC 2.10V ±0.05V. For 45 rpm . . . confirm that there is DC 2.80 ~ 2.86V.
B	Adjustment of current source (IR)	DC voltmeter or Oscilloscope ⊕ → TP19 ⊖ → TP21	**VR202**	Turn start switch on to begin turntable rotation. Adjust VR202 for 0V potential difference of TP19 and TP21.
C	Tracking adjustment	Oscilloscope ⊕ → TP18 ⊖ → GROUND	**VR101**	**TP18 waveform**  For 33 rpm . . . adjust VR101 for $8 \leqq To \leqq 8.5$ ms. For 45 rpm . . . confirm that $5.8 \leqq To \leqq 6.4$ ms.
D	Braking adjustment	——	**VR203**	 Adjust VR203 for complete stop within 90° ~ 180° after stop signal initiated. (Turntable becomes free a few seconds after stop.)
E	Optical sensor gain adjustment	Oscilloscope ⊕ → TP32 ⊖ → GROUND	**VR501**	**TP32 waveform**  With arm near center spindle, manually move with uniform motion, and adjust VR501 as that the (a) and (b) pitch of the waveform of TP32 is equal.
F	Auto-Return time adjustment	Oscilloscope ⊕ → TP38 ⊖ → GROUND	**VR502**	**TP38 waveform**  Turn power switch on, and adjust VR502 so that the time (To) from power on until the voltage of TP38 inverts is 1.5 second at 33 rpm. (1.1 second at 45 rpm) TP37: for 33 rpm . . . 0V for 45 rpm . . . 2V

■ JUSTIERUNGEN-3

Justierungspunkte des elektrischen Systems

Bemerkung: Nehmen Sie die folgenden Justierungen nach erfolgtem Austausch von Teilen, wie IC's, Transistoren, Dioden, usw. vor.

	Justierung	Verbindungs-punkte	Justierungs-punkt	Justierungsmethode
A	Justierung der Nennspannung (VS)	Gleichstrom-Voltmeter oder Oszilloskop ⊕ → TP15 ⊖ → GROUND	**VR201**	Start-Schalter drehen, um die Plattentellerdrehung zu starten. Für 33 U/min . . . VR201 auf DC 2,10V ±0,05V abgleichen. Für 45 U/min . . . Sicherstellen, da die Spannung 2,80 ~ 2,86V beträgt.
B	Justierung der Stromquelle (IR)	Gleichstrom-Voltmeter oder Oszilloskop ⊕ → TP19 ⊖ → TP21	**VR202**	Start-Schalter drehen, um die Plattentellerdrehung zu starten. VR202 auf eine Spannungsdifferenz von 0V zwischen TP19 und TP21 justieren.
C	Abtast-Justierung	Oszilloskop ⊕ → TP18 ⊖ → GROUND	**VR101**	**TP18 Wellenform**  Für 33 U/min . . . VR101 auf $8 \leqq To \leqq 8{,}5$ ms abgleichen. Für 45 U/min . . . $5{,}8 \leqq To \leqq 6{,}4$ ms sicherstellen.
D	Brems-Justierung	——	**VR203**	 VR203 für vollständigen Stop innerhalb 90° ~ 180° nach erfolgtem Stopsignal abgleichen. (Plattenteller wird wenige Sekunden nach dem Stop freigestellt.)
E	Verstärkungs-Justierung des optischen Sensors	Oszilloskop ⊕ → TP32 ⊖ → GROUND	**VR501**	**TP32 Wellenform**  Mit dem Tonarm nahe der Plattentellerachse, ihn von Hand gleichmäßig bewegen und VR501 so justieren, daß Kurven(a) und (b) der Wellenform TP32 gleich werden.
F	Justierung der Auto-Rückkehrzeit	Oszilloskop ⊕ → TP38 ⊖ → GROUND	**VR502**	**TP38 Wellenform**  Netzschalter einschalten, und VR502 so justieren, daß die Zeit (To)vom Einschalten des Stroms bis zur Umkehr der Spannung von TP38 bei 33 U/min 1,5 sec. beträgt. (1,1 sec bei 45 U/min) TP37: für 33 U/min . . . 0V für 45 U/min . . . 2V



■ TERMINAL GUIDE

① 2SC1826

② 2SC1383, 2SC1384, 2SA719, 2SA564, 2SC828, 2SC828A

③ 2SC1406

④ AN640

⑤ AN660, DN860

⑥ MN6042

⑦ SVIMSM4075, SVIMSM4069

⑧ SVDGL-7R204

⑨ SVDGL-7R203

IMPORTANT SAFETY NOTICE

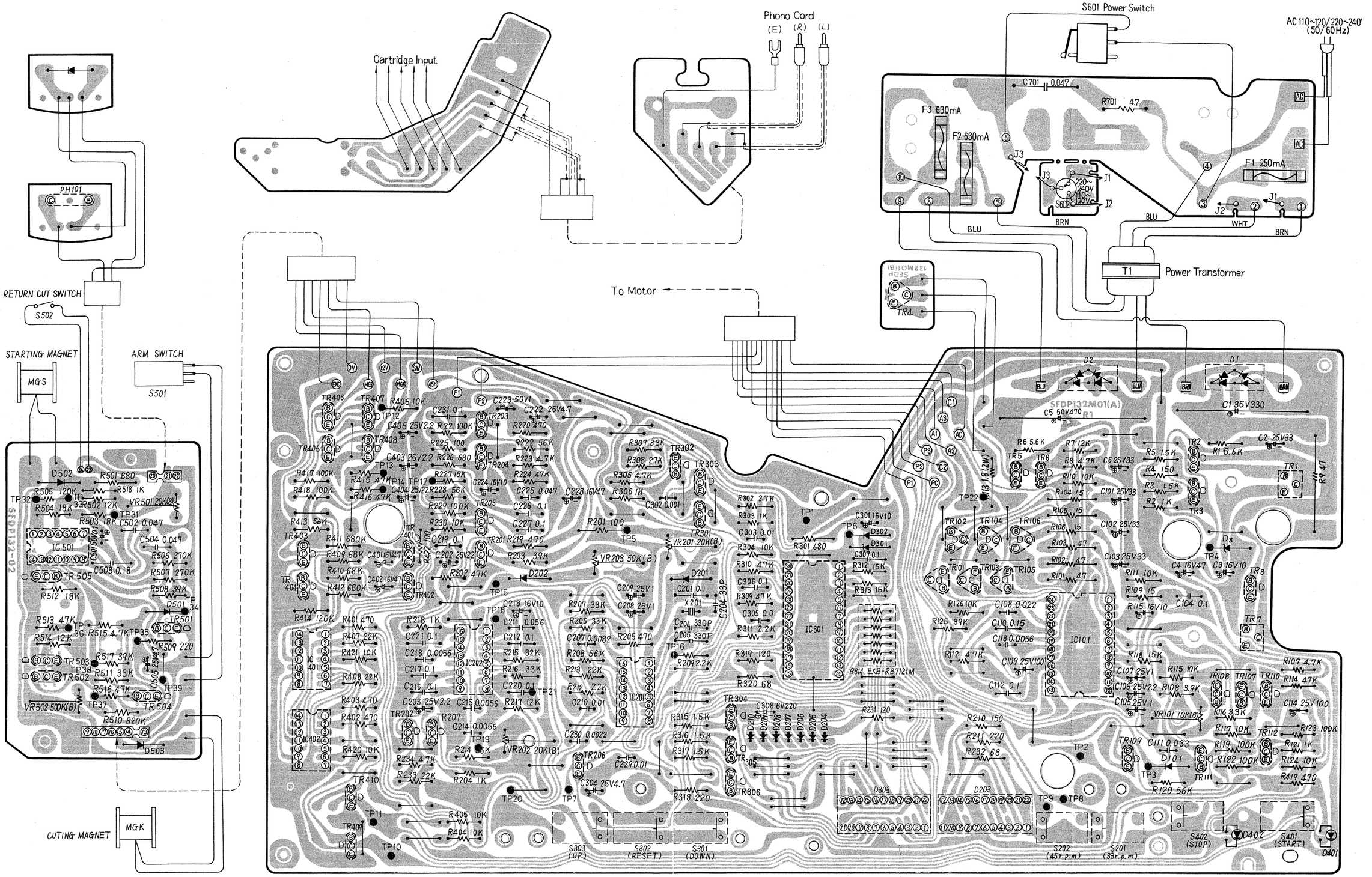
THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY.
WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTUR'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

Notes:

1. **S201:** Speed select switch (33 r.p.m.)
2. **S202:** Speed select switch (45 r.p.m.)
3. **S301:** Pitch Control switch (Down)
4. **S302:** Pitch Control switch (Reset)
5. **S303:** Pitch Control switch (Up)
6. **S401:** Start switch in "**off**" position.
7. **S402:** Stop switch in "**off**" position.
8. **S501:** Arm switch in "**off**" position.
9. **S502:** Return cut switch in "**off**" position.
10. **S601:** Power switch in "**off**" position.

11. The voltage values entered are the values measured from the chassis with a standard tester that has an internal resistance of 100KΩ/V.

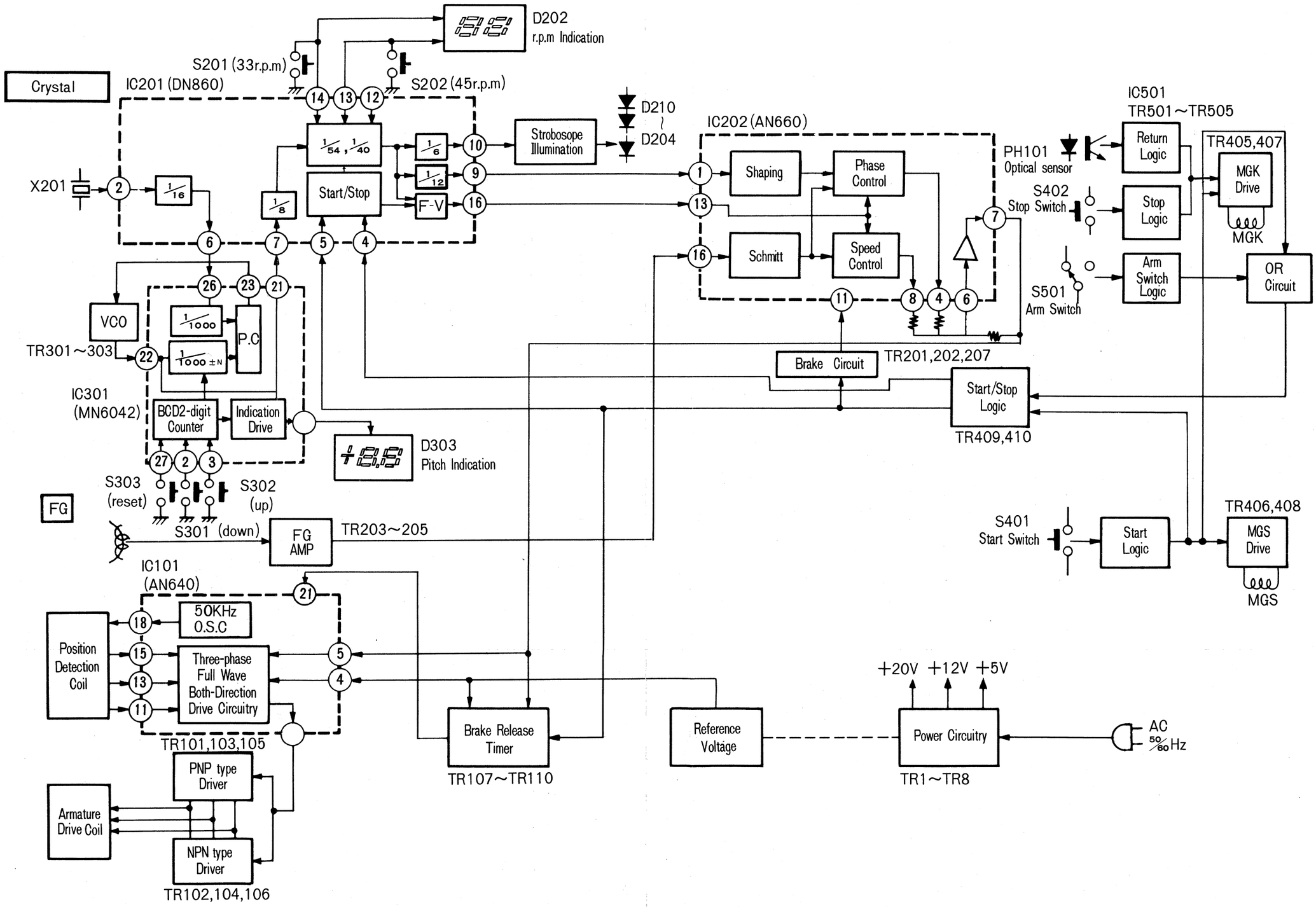
TR1, 4, 7	2SC1826	IC101	AN640
TR2, 3, 6, 8, 405, 406	2SC1328-T	IC201	DN860
		IC202	AN660
TR5	2SC1384	IC301	MN6042
TR102, 104, 106	2SC1406	IC401	SVIMSM4069
TR101, 103, 105	2SA752	IC402	SVIMSM4075
TR107, 107, 111 301, 302, 505	2SA666AI-R	IC501	SVIMSM4011
		D1, 2	SVDSIRBA20
TR109, 110, 112, 201 ~ 207, 303 401 ~ 404, 409, 410, 501 ~ 504	2SC1328-T	D3, 301	SVDRD5.1EBS
		D101, 202, 302, 501 ~ 503	MA150
TR304 ~ 306	2SA719	D201	SVDRD9.1EBS
TR407, 408	2SC1384	D203	SVDGL-7R204
		D204 ~ 210	SVDSR105C
		D303	SVDGL-7R203
		D401, 402	SVDSR105C



	TR1 2SC1826	TR2 2SC828A	TR3 2SC828A	TR4 2SC1826	TR5 2SC1383	TR6 2SC828A	TR7 2SC1826	TR8 2SC828A	TR101 2SA751	TR102 2SC1406	TR103 2SA751	TR104 2SC1406	TR105 2SA751	TR106 2SC1406	TR107 2SA564	TR108 2SA564	TR109 2SC828	TR110 2SC828	TR111 2SA564	TR112 2SC828	TR201 2SC828	TR202 2SC828	TR203 2SC828	TR204 2SC828
E	12 V	12.6 V	4.9 V	20 V	20.6 V	4.9 V	5 V	5.6 V	20 V	0 V	20 V	0 V	20 V	0 V	0.1 V	0.1 V	0 V	0 V	20 V	0 V	0 V	0 V	0 V	0.75 V
C	21 V	21 V	13.2 V	33.7 V	33.7 V	13.2 V	13 V	13 V	10 V	10 V	10 V	10 V	10 V	10 V	0 V	0 V	19.5 V	0.1 V	0 V	0 V	0 V	0 V	1.4 V	5.4 V
B	12.6 V	13.2 V	5.5 V	20.6 V	21.2 V	5.5 V	5.6 V	6.2 V	19.3 V	0.1 V	19.3 V	0.1 V	19.3 V	0.1 V	7 V	7 V	0 V	0.7 V	19.5 V	0.7 V	0.6 V	0.7 V	0.7 V	1.4 V

	TR205 2SC828	TR206 2SC828	TR207 2SC828	TR301 2SA564	TR302 2SA564	TR303 2SC828	TR304 2SA719	TR305 2SA719	TR306 2SA719	TR401 2SC828	TR402 2SC828	TR403 2SC828	TR404 2SC828	TR405 2SC828A	TR406 2SC828A	TR407 2SC1384	TR408 2SC1384	TR409 2SC828	TR410 2SC828	TR501 2SC828	TR502 2SC828	TR503 2SC828	TR504 2SC828	TR505 2SA564
E	6.2 V		0 V	1.3 V	1.3 V	0 V	5.2 V	5.2 V	5.2 V	0 V	0 V	0 V	0 V	0 V	0 V	0 V	0 V	0 V	0 V	0 V	10 V	10 V	0 V	0 V
C	11 V		2.9 V	0.7 V	0 V	0.8 V	0 V	4.4 V	4.6 V	12 V	12 V	0 V	0 V	12 V	12 V	12 V	12 V	0.6 V	2 V	0 V	12 V	12 V	0.9 V	0 V
B	7 V		0 V	0.6 V	0.8 V	0.7 V	4.6 V	4.6 V	4.6 V	0 V	0 V	0.6 V	0.6 V	0 V	0 V	0 V	0 V	0.6 V	0 V	0 V	10 V	32 V	0.2 V	12 V

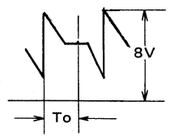
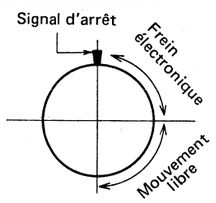
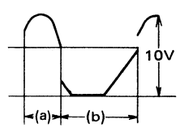
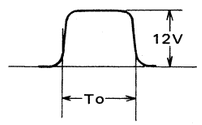
■ BLOCK DIAGRAM



■ REGLAGES-3

Points de réglage du système électrique.

NOTA: Réaliser les mises au point suivantes après le remplacement de certains éléments tels que circuits intégrés, transistors, diodes, etc.

	Réglage	Points de branchements	Point de réglage	Méthode de réglage
A	Réglage de la tension normalisée (VS)	Voltmètre à CC ou Oscilloscope. ⊕ → TP15 ⊖ → GROUND	**VR201**	Ouvrir le commutateur de marche pour le démarrage rotationnel du plateau. Pour 33 t/m . . . régler VR201 pour CC 2,10V ±0,05V. Pour 45 t/m . . . s'assurer qu'il y a un CC 2,80 – 2,86V.
B	Réglage de la source de courant (IR)	Voltmètre à CC ou Oscilloscope. ⊕ → TP19 ⊖ → TP21	**VR202**	Ouvrir le commutateur de marche pour le démarrage rotationnel du plateau. Régler VR202 pour une différence potentielle 0V de TP19 et TP21.
C	Réglage d'alignement	Oscilloscope ⊕ → TP18 ⊖ →GROUND	**VR101**	**Forme d'onde TP18**  Pour 33 t/m . . . régler VR101 pour $8 \leqq To \leqq 8,5$ ms. Pour 45 t/m . . . s'assurer que $5,8 \leqq To \leqq 6,4$ ms.
D	Réglage du freinage	——	**VR203**	Signal d'arrêt  Régler VR203 pour un arrêt total en deçà de 90° – 180° après que le signal d'arrêt ait débuté. (Le plateau deviendra libre quelques secondes après l'arrêt).
E	Réglage du gain du capteur optique	Oscilloscope ⊕ → TP32 ⊖ →GROUND	**VR501**	**Forme d'onde TP32**  Avec le bras près du pivot central, déplacer manuellement d'un mouvement uniforme et régler VR501 de façon à ce que l'ecart (a) et (b) de la forme d'onde de TP32 devienne égal.
F	Réglage de la durée de retour automatique	Oscilloscope ⊕ → TP38 ⊖ →GROUND	**VR502**	**Forme d'onde TP38**  Intempteur d'alimentation en marche. Mettre en marche l'interrupteur d'alimentation et régler VR502 de facon à ce que la durée (T_O) de puissance en marche sous la tension de TP38 s'invertisse en 1,5 seconde à 33 t/m. (1,1 seconde à 45 t/m) TP37: pour 33 t/m . . . 0V. pour 45 t/m . . . 2V.

■ TROUBLE SHOOTING

(A) **Automatic start, Manual start**
Neither rotates

→ Power circuitry check
TP1 – 12V (11 ~ 13V)
TP2 – 5V (4.6 ~ 5.4V)
TP3 – 20V (18.5 ~ 21V)
BAD → TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, D1, D2, D3

OK ↓

Brake release timer circuitry check
TR109 collector voltage: Start – 19.5V, Stop – 0V
BAD → TR107, TR108, TR109, TR110, TR111, TR112, D101

OK ↓

Drive circuitry check
1) IC101 voltage (Fig. 22)
2) TR101 (TR103, TR105)
collector voltage: Start – 10V, Stop – 2V
BAD → IC101, TR101, TR102, TR103, TR104, TR105, TR106

OK ↓

Start/stop circuitry check
(while starting and stopping with S501)
TR409 collector voltage: Start – 0V, Stop – 3.2V
TR410 collector voltage: Start – 2V, Stop – 0V
BAD → S501 (Arm SW), IC401, IC402, IC201, TR409, TR410, D401, D402

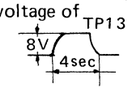
Reference voltage of each pin of IC101

(Fig. 22)

	Start	Stop		Start	Stop		Start	Stop
①②③	0.8V	0.1V	⑩	14.5V	15.2V	⑰	15.5V	15.5V
④	5.8V	6.1V	⑪⑬⑮	20ms, 15.6V	Same as at left	⑱	20ms, 20V	Same as at left
⑤	5.9V	10.5V				⑲	20.6V	20.6V
⑥	4.7V	2.2V	⑫	14.9V	15V	⑳	15.3V	1.4V
⑦	4.9V	4.9V				㉑	20.5V	16.4V
⑧	20.5V	20.5V	⑭	14.9V	15V	㉒㉓㉔	20V	20V
⑨	5V	0.2V	⑯	0V	0V			

(B) No rotation when automatic start (manual start OK)

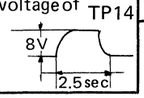
MGS drive circuitry check. When S401 (start switch) is ON, does voltage of about 8V appear at TP13



BAD → S401
TR401, TR403, TR405
TR407, IC401
D502,MGS

OK

MGK drive circuitry check. When S401 (start switch) is ON, does voltage of about 8V appear at TP14.



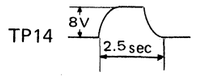
BAD → IC401, IC402
TR402, TR404, TR406, TR408
D503, MGK

OK

Mechanism operation check at time of start when MGS functions, solenoid support plate (Ref. 55) held → Direction of arm movement determined
When MGK functions, Main gear support plate (Ref. 51) pushed → Main gear rotates

(C) Neither Auto Return nor Auto Stop functions

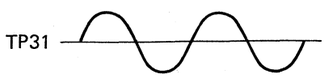
MGK drive circuitry check when S402 (stop switch) is ON, does voltage of about 8V appear at TP14?



BAD → S402
IC401, IC402

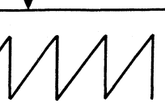
(D) No Auto Return...[Auto Return switch on] (Auto Stop OK)

Optical sensor circuitry (while moving with arm at return position)



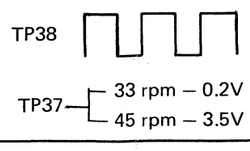
BAD → PH101

OK



BAD → IC501
TR501
D501

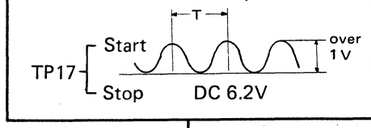
OK



BAD → IC501, TR502, TR503
TR504, TR505

(E) Runaway operation

FG circuitry check



BAD → TR203, TR204, TR205

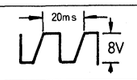
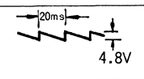
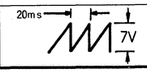
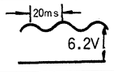
OK

Control circuitry check
1) IC202 voltage (Fig. 23)
2) TR201, TR202, TR207 collector voltage

TR201 — Start – 0V / Stop – 4V
TR202 — Start – 0V / Stop – 1V
TR207 — Start – 2.5V / Stop – 0V

BAD → IC202
TR201, TR202, TR207
D202

Reference voltage of each pin of IC202
(Fig. 23)

	Start	Stop		Start	Stop		Start	Stop
①		0 V	⑥	6.3V	6.3V	⑫	2.1V	2.7V
			⑦	5.8V	10.5V	⑬	2.1V	2.7V
②	Same at TP18	0 V	⑧	6.3V	5.0V	⑭		7.5V
③		6.1V	⑨		7.1V			
			⑩	0 V	0 V	⑮	11.7V	11.7V
④	6.6V	6.2V	⑪		7.5V	⑯		5.5V
⑤	11.7V	11.7V						

(F) 33-45 rpm Changeover malfunction

Speed-set circuitry check IC201 ⑬ ⑭ pin voltage

⑬ — 33 rpm – 3.5V / 45 rpm – 0.2V
⑭ — 33 rpm – 0.2V / 45 rpm – 3.5V

BAD → IC201 D203
S201
S202

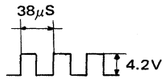
(G) **Pitch control malfunction**
Stroboscope synchronization malfunction

→ Quartz-crystal oscillation power check
TP5 – 9V (8.5 ~ 9.5V)
BAD → D201

OK ↓

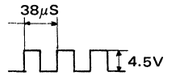
VCO power check
TP6 – 5V (4.6 ~ 5.4V)
BAD → D301, D302

OK ↓

Quartz-crystal oscillation circuitry check
1) TP16 

2) IC201 voltage (Fig. 24)
BAD → X201, IC201

OK ↓

Pitch control circuitry check
1) IC201 ⑦ pin 

2) IC301 voltage (Fig. 25)
BAD → IC301, TR301,TR302,TR303, TR304,TR305,TR306, D303

Reference voltage of each pin of IC201 (Fig. 24)

	Start	Stop		Start	Stop		Start	Stop
①	9.4V	9.4V	⑦	3.8μs, 4.5V	Same as at left	⑪	0 V	0 V
②	0.24μs, 1.8V	Same as at left	⑧	20ms, 8V	0 V	⑫	6 V	6 V
③	0.24μs, 0.9V	Same as at left	⑨	20ms, 4.2V	4.3V	⑬	3.5V	Same as at left
④	0 V	3.2V	⑩	10ms, 1 V	Same as at left	⑭	0.2V	0.2V
⑤	2.0V	0 V				⑮	7V	Same as at left
⑥	3.8μs, 4.2V	Same as at left				⑯	20ms, 7V	0 V

Reference voltage of each pin of IC301 (Fig. 25)

	Start	Stop		Start	Stop		Start	Stop
①②③	4.9V	4.9V	⑰⑱	4ms, 4.8V	Same as at left	㉓	2.4V	Same as at left
						㉔	2.4V	Same as at left
④⑧ ⑤⑨ ⑥⑩ ⑦	0 V	0 V	⑳	2ms, 4.6V	Same as at left	㉕	4ms, 5V	Same as at left
⑩⑬ ⑪⑭ ⑫⑮	3.5ms, 4V	Same as at left	㉑	3.8μs, 5.9V	Same as at left	㉖	3.8μs, 4.2V	Same as at left
⑯	3.5ms, 4.2V	Same as at left	㉒	3.8μs, 6V	Same as at left	㉗	5 V	5 V
						㉘	5 V	5 V

■ REPLACEMENT PARTS LIST

Important Safety Notice
Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

NOTE: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. SL-1300MK2A(X) ⟶ [X] SL-1300MK2(XG) ⟶ [XG] SL-1310MK2(XG) ⟶ [10XG]
SL-1300MK2(E) ⟶ [E] SL-1300MK2A(XGF) ⟶ [XGF] SL-1300MK2A(E) ⟶ [AE]
SL-1300MK2(XAL) ⟶ [XAL] SL-1310MK2(E) ⟶ [10E] SL-1310MK2A(XG) ⟶ [10AXG]
SL-1310MK2A(E) ⟶ [10AE]

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		INTEGRATED CIRCUITS		
IC101	AN640	Drive Circuit	1	
IC201	DN860	Frequency Divider Circuit	1	○
IC202	AN660	Control Circuit	1	○
IC301	MN6042	Pitch Control Circuit	1	○
IC401	SVIMSM4069	Start & Stop Logic Circuit (NOT)	1	○
IC402	SVIMSM4075	Start & Stop Logic Circuit (OR)	1	○
IC501	SVIMSM4011	Optical Censor Return Pulse Circuit (NAND)	1	○
		TRANSISTORS		
TR1, 4, 7	2SC1826-Y	Transistors (Use in ranks O or Y or G)	3	○
TR2, 3, 6, 8, 405, 406	2SC1328-T	Transistors	6	
TR5	2SC1384A-Q			
TR101	2SA752-Q	Transistor (Use in ranks Q or R or S)	1	
TR102	2SC1406-Q	Transistor (Use in pair ranks Q or R or S)	1	
TR103	2SA752-Q	Transistor (Use in pair ranks Q or R or S)	1	
TR104	2SC1406-Q	Transistor (Use in pair ranks Q or R or S)	1	
TR105	2SA752-Q	Transistor (Use in pair ranks Q or R or S)	1	
TR106	2SC1406-Q	Transistor (Use in pair ranks Q or R or S)	1	
TR107, 108, 111, 301, 302, 505	2SA666AI-R	Transistor (Use in ranks Q or R or S)	6	
TR109, 110, 112, 201, 202, 203, 204, 205, 206, 207, 303, 401, 402, 403, 404, 409, 410, 501, 502, 503, 504	2SC1328-T	Transistor	21	
TR304, 305, 306	2SA719-P	Transistors (Use in ranks P or Q or R or S)	3	○
TR407, 408	2SC1384-Q	Transistors (Use in ranks Q or R or S)	2	
		DIODES		
D1, 2	SVDSIRBA20	Rectifier	2	○
D3, 301	SVDRD5.1EBS	5.1V Zener, Voltage Stabilizer	2	○
D101, 202, 302, 501, 502, 503	MA150	Diodes	6	
D201	SVDRD9.1EBS	9.1V Zener, Voltage Stabilizer	1	○
D203	SVDGL-7R204	Light Emitting Diode (r.p.m)	1	○
D204, 205, 206, 207, 208, 209, 210, 401, 402	SVDSR105C	Light Emitting Diode	9	○
D303	SVDGL-7R203	Light Emitting Diode (pitch)	1	○
		CRYSTAL		
X204	SVQU306115	4.19328MHz Oscillator	1	○
		TRANSFORMER		
T1	SLTF5353	Power Transformer	1	○
		FUSE		
F1	XBA2C025TR0	250mA (Fuse)	1	○
F2, 3	XBA2C06TR0	630mA (Fuse)	2	○

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		SWITCHES		
S201, 202	EVOP4R04K	Speed Selector Switches	2	○
S301, 302, 303	EVOP4R04K	Pitch Control Switches	3	○
S401, 402	EVOP4R04K	Start or Stop Switches	2	○
S501	SFDSAH73502	Arm Switch	1	
S502	ES86015	Return Cut Switch	1	
S601	SFDSSS5G1.2S	Power Switch	1	○
S602	SFDSHXW13312	Switch, Power Source	1	
	SFDSHSW0634	Muting Switch, Tone Arm	1	○
		RESISTORS		
R1	ERD25TJ562	Carbon, 5.6kΩ, 1/4W, ± 5%	1	
R2	ERD25TJ102	Carbon, 1kΩ, 1/4W, ± 5%	1	
R3	ERD25TJ152	Carbon, 1.5kΩ, 1/4W, ± 5%	1	
R4	ERD25TJ151	Carbon, 150Ω, 1/4W, ± 5%	1	
R5	ERD25TJ152	Carbon, 1.5kΩ, 1/4W, ± 5%	1	
R6	ERD25TJ562	Carbon, 5.6kΩ, 1/4W, ± 5%	1	
R7	ERD25TJ123	Carbon, 12kΩ, 1/4W, ± 5%	1	
R8	ERD25TJ472	Carbon, 4.7kΩ, 1/4W, ± 5%	1	
R9	ERG3ANJ470	Metal Film, 47Ω, 3W, ± 5%	1	
R101, 102, 103	ERX1ANJ470	Metal Film, 47Ω, 1W, ± 5%	3	
R104, 105, 106	ERX1ANJ150	Metal Film, 15Ω, 1W, ± 5%	3	
R107	ERD25TJ472	Carbon, 4.7kΩ, 1/4W, ± 5%	1	
R108	ERD25TJ392	Carbon, 3.9kΩ, 1/4W, ± 5%	1	
R109	ERD25TJ150	Carbon, 15Ω, 1/4W, ± 5%	1	
R110, 111	ERD25TJ103	Carbon, 10kΩ, 1/4W, ± 5%	2	
R112	ERD25TJ472	Carbon, 4.7kΩ, 1/4W, ± 5%	1	
R113	ERX1ANJ1R8	Metal Film, 1.8Ω, 1W, ± 5%	1	
R114	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%	1	
R115	ERD25TJ103	Carbon, 10kΩ, 1/4W, ± 5%	1	
R116	ERD25TJ332	Carbon, 3.3kΩ, 1/4W, ± 5%	1	
R117	ERD25TJ103	Carbon, 10kΩ, 1/4W, ± 5%	1	
R118	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%	1	
R119	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%	1	
R120	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%	1	
R121	ERD25TJ102	Carbon, 1kΩ, 1/4W, ± 5%	1	
R122, 123	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%	2	
R124	ERD25TJ103	Carbon, 10kΩ, 1/4W, ± 5%	1	
R125	ERD25TJ393	Carbon, 39kΩ, 1/4W, ± 5%	1	
R126	ERD25TJ103	Carbon, 10kΩ, 1/4W, ± 5%	1	
R201	ERX1ANJ101	Metal Film, 100Ω, 1W, ± 5%	1	
R202	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%	1	
R203	ERD25TJ393	Carbon, 39kΩ, 1/4W, ± 5%	1	
R204	ERD25TJ102	Carbon, 1kΩ, 1/4W, ± 5%	1	
R205	ERD25TJ471	Carbon, 470Ω, 1/4W, ± 5%	2	
R206, 207	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%	2	
R208	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%	1	
R209	ERD25TJ222	Carbon, 2.2kΩ, 1/4W, ± 5%	1	
R210	ERD25TJ151	Carbon, 150Ω, 1/4W, ± 5%	1	
R211	ERD25TJ221	Carbon, 220Ω, 1/4W, ± 5%	1	
R212	ERD25TJ222	Carbon, 2.2kΩ, 1/4W, ± 5%	2	
R213	ERD25TJ223	Carbon, 22kΩ, 1/4W, ± 5%	1	
R214	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%	1	
R215	ERD25TJ823	Carbon, 82kΩ, 1/4W, ± 5%	1	
R216	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%	1	
R217	ERD25TJ123	Carbon, 12kΩ, 1/4W, ± 5%	1	
R218	ERD25TJ102	Carbon, 1kΩ, 1/4W, ± 5%	1	
R219, 220	ERD25TJ471	Carbon, 470Ω, 1/4W, ± 5%	2	
R221	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%	1	
R222	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%	1	
R223	ERD25TJ472	Carbon, 4.7kΩ, 1/4W, ± 5%	1	

VARIABLE RESISTORS

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
VR101	EVNDAAA03B54	Volume	1	
VR102	EVNDAAA03B14	Tone	1	
VR103	EVNDAAA03B54	Balance	1	

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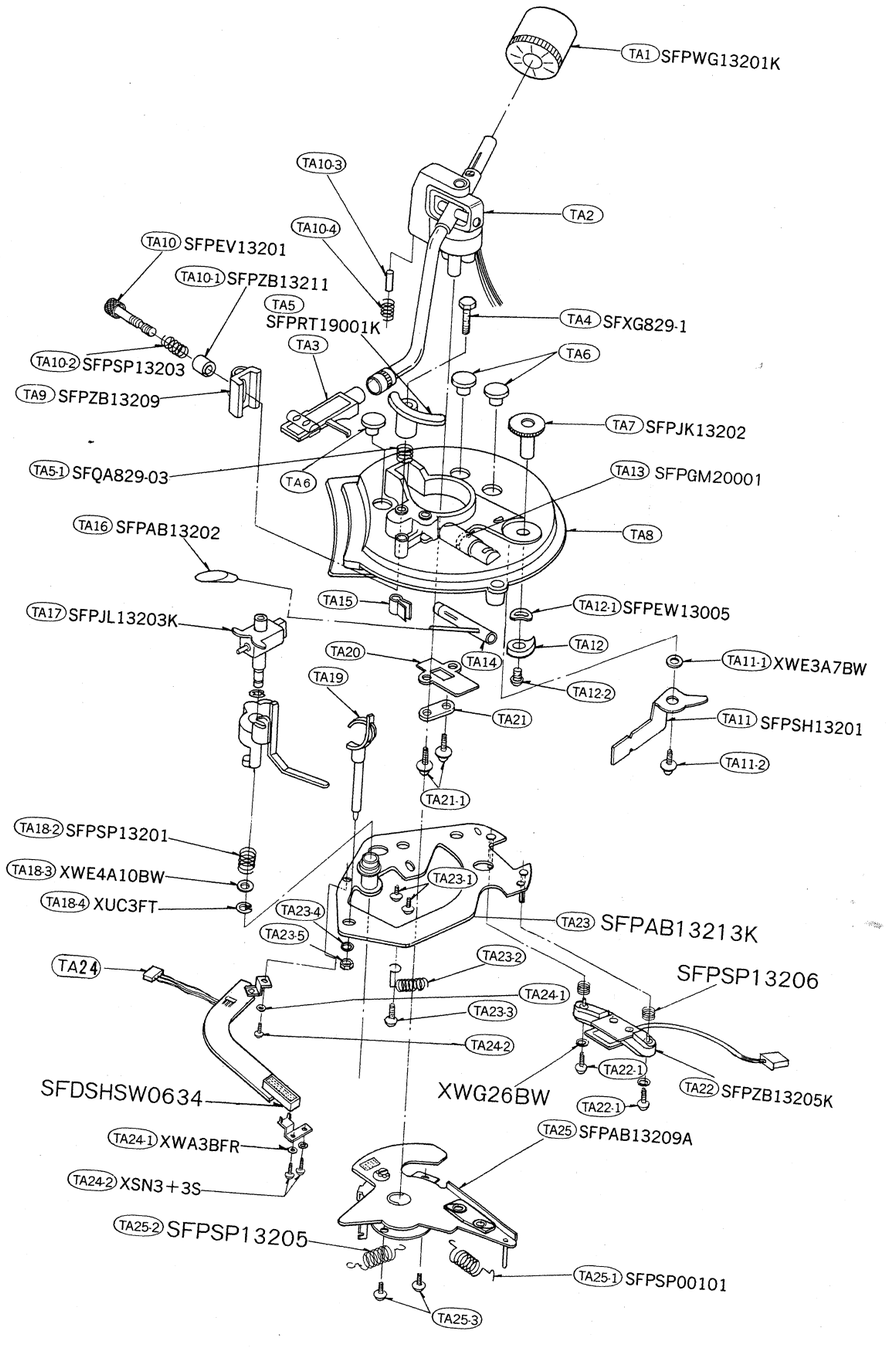
Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
19	SFUP132-03	Bracket, Power Transformer	1	
19-1	SFGC132-01	Spacer (Rubber), Power Transformer Bracket	1	
19-2	**XTN4+10B**	Screw, Power Transformer	2	
19-3	SFXW750-01	Washer, Power Transformer	3	
19-4	**XTN3+10B**	Screw, Power Transformer Bracket	1	
20	SFKT132-07	Knob, Manual Switch	1	
21	SFUP132-10	Bracket, Manual Switch	1	
22	SFDJ132-05E	Connector, 2P Ass'y	1	
22-1	**XTN3+8B**	Screw, Manual Switch	4	
23	SFUK132-01E	Operation Plate Ass'y	1	
24	SFUM13214	Lever, Select Cam	1	
25	SFUP132-05	Plate, Operation Support	1	
26	SFUM132-11	Cam, Repeat	1	
27	SFUM132-12	Gear, Operation Plate	1	
28	SFUM132-13	Cam, Select	1	
28-1	SFYB5-32	Steel Ball, Select Cam	2	
28-2	SFQA829-2	Spring Select Cam	2	
28-3	**XTN3+8B**	Screw, Operation Plate	2	
28-4	**XTN3+8B**	Screw, Operation Plate	3	
29	SFUP132-02E	Bracket, Power Switch	2	
29-1	SFUZ132-02	Felt, Power Switch Knob	1	
29-2	SFXJ132-03	Support, Power Switch Knob	1	
29-3	SFQA001-02	Spring, Power Switch Knob	1	
29-4	SFUP001-10	Support, Power Switch Knob	1	
30	SFUM01-11	Cam, Power Switch	1	
30-1	SFUP001-12	Support, Power Switch	1	
30-2	SFUM132-07	Cam, Power Switch Cam	1	
31	SFUM132-05	Holder, Power Switch	1	
32	SFUM132-06	Holder, Power Switch	1	
32-1	**XTN3+8B**	Screw, Power Switch Bracket	2	
32-2	**XTN3+16B**	Screw, Power Switch Holder	1	
32-3	**XSN3+10S**	Screw, Power Switch Cam	1	
32-4	**XWC3B**	Washer, Power Switch Cam	1	
33	SFUP132-08	Mirror	1	
34	SFUP132-04	Bracket, Panel	2	
34-1	**XTN3+10B**	Screw, Panel Bracket	2	
35	SFKT132-05	Knob, Power Switch	2	
36 [X, XAL, E XG,XGF,AE]	SFUM132X01	Panel	1	
36 [10E, 10XG, 10AXG, 10AE]	SFUM133S01	Panel	1	
37	SFKT132-03	Knob, Operation	4	
38	SFKT132-04	Knob, Operation	1	
39	SFKT132-01E	Knob, Operation	1	
40	SFKT132-02E	Knob, Operation	1	
41	SFUM132-09	Felt	1	
41-1	**XWA3B**	Washer, Panel	4	
41-2	**XWG3BS**	Nut, Panel	4	
41-3	**XTN3+8B**	Screw, P.C.B	8	
42	SFXB132-01	Spacer, Operation	2	
42-1		Spacer, Operation	5	
42-2	SFXG132-01	Screw, Operation	4	
42-3	**XNS6JM**	Nut, Operation Spacer	2	
42-4	**XNG4HS1**	Nut, Operation Spacer	5	
42-5	SFQA132-01	Spring, Operation Knob	2	
42-6	SFQA132-02	Spring, Operation Knob	5	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C304	**ECEA50V4R7**	Electrolytic, 4.7μF, 50V	1	
C305	**ECQM1H103KZ**	Polyester, 0.01μF, 50V, ±10%	1	
C306	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1	
C307	ECKD1E1042FZ	Ceramic, 0.1μF, 50V	1	
C308	**ECEA6V220**	Electrolytic, 220μF 6V,	1	
C310	**ECQM1H102KZ**	Polyester, 0.001μF, 50V, ±10%	1	
C401, 402	ECEA16Z47	Electrolytic, 47μF, 16V	2	
C403, 404	**ECEA50V2R2**	Electrolytic, 2.2μF, 50V	2	
C501	**ECEA50Z R1**	Electrolytic, 1μF 50V	1	
C502	**ECQM1H473KZ**	Polyester, 0.047μF, 50V, ±10%	1	
C503	**ECQM1H184KZ**	Polyester, 0.18μF, 50V, ±10%	1	
C504	**ECQM1H473KZ**	Polyester, 0.047μF, 50V, ±10%	1	
C505	**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V	1	
C701 [X, XG, XGF, 10AXG]	ECQE2A473MZ	Polyester, 0.047μF, 250V, ±20%	1	
C701 [XAL,E,AE, 10E,10AE]	ECNC4A473M	Polyester, 0.047μF, 450V, ±20%	1	
		CABINET and CHASSIS PARTS		
1	SFAD132-01A	Dust Cover	1	
2	SFAT165-01A	Hinge Ass'y	2	
3	SFTG170-01	Turntable Mat	1	
4	SFTE132-01A	Turntable	1	
5	SFKT132-06A	Knob, Operation	2	
6	SFUM132-02	Cover, Panel	1	
6-1	**XTN3+8BFZ**	Screw, Panel Cover	2	
6-2 [X, XG, XGF AE]	SFNN132X01	Name Plate	6	
6-2 [XAL]	SFNN132G01	Name Plate	1	
6-2 [E]	SFNN132S01	Name Plate	1	
6-2 [10E]	SFNN133S01	Name Plate	1	
6-2 [10XG, 10AXG, 10AE]	SFNN133N01	Name Plate	1	
7	SFUM132-04	Cover, Power Transformer	1	
7-1	**XTN3+10BFZ**	Screw, Power Transformer Cover	2	
7-2	**XWG3**	Washer, Power Transformer Cover	2	
8 [Except XAL]	**SFKP419C**	AC Cord	1	
8 [XAL only]	QFEC1208M	AC Cord	1	
9	SFUM170-06	Spacer, AC Power Cord	1	
10 [Except XAL]	SFUM170-11	Bracket, AC Power Cord	1	
10 [XAL only]	SFUM170-05	Bracket, AC Power Cord	1	
10-1	**XTN3+14BFZ**	Screw, AC Power Cord Bracket	1	
10-2	**XWG3**	Washer, AC Power Cord Bracket	2	
11	SFUM170-07	Case, Hinge Ass'y	2	
11-1	**XTN3+8BFZ**	Screw, Hinge Ass'y	2	
12	SFDH028-01	Phono Cord	4	
13	SFEL028-01E	Ground Wire	1	
14	SFUM170-06	Spacer, Phono Cord	1	
15	SFUM170-11	Bracket, Phono Cord	1	
15-1	**XTN3+14BFZ**	Screw, Phono Cord Bracket	2	
15-2	**XWG3**	Washer, Phono Cord Bracket	2	
16	**XTN3+8B**	Screw, Phono P.C.B	1	
17 [X,XAL,E,XG, XGF, AE]	SFAC132-01	Cabinet	1	
17 [10E, 10XG 10AXG, 10AE]	SFAC133S01	Cabinet	1	
17-1	SFUP132X01	Plate, Insulation	1	
18	**XTN3+8B**	Screw, P.C.B	2	

■ EXPLODED VIEWS



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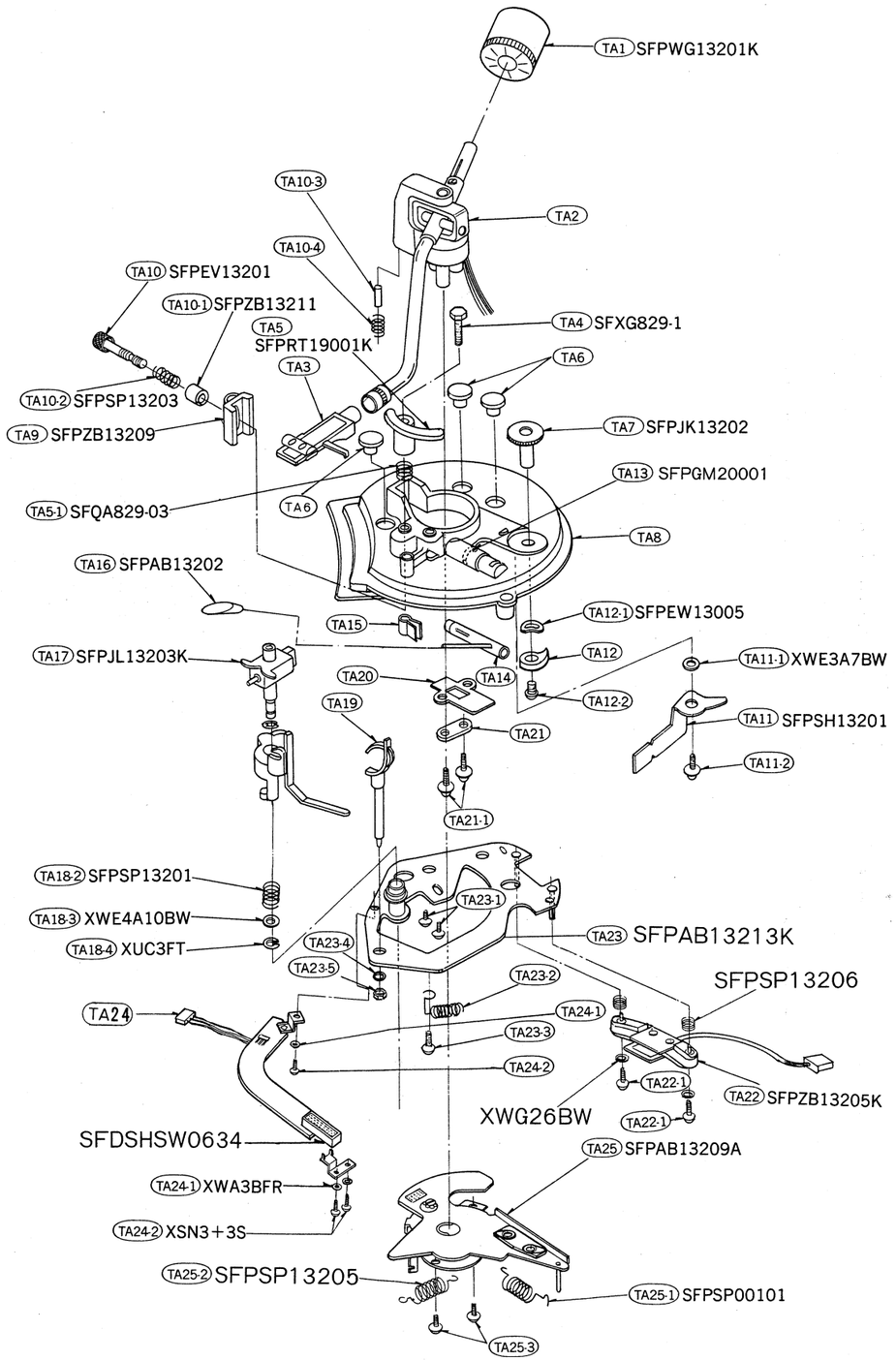

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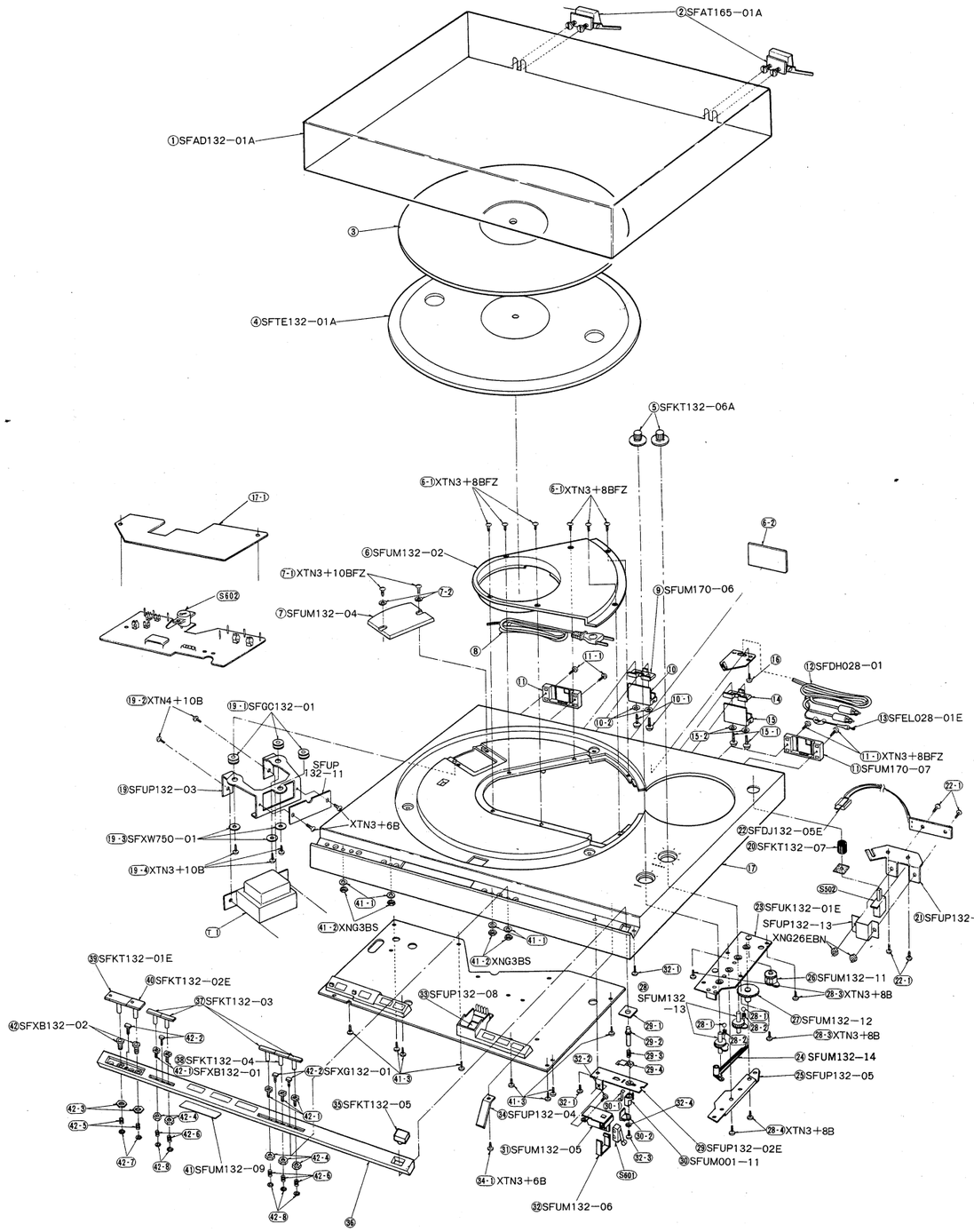

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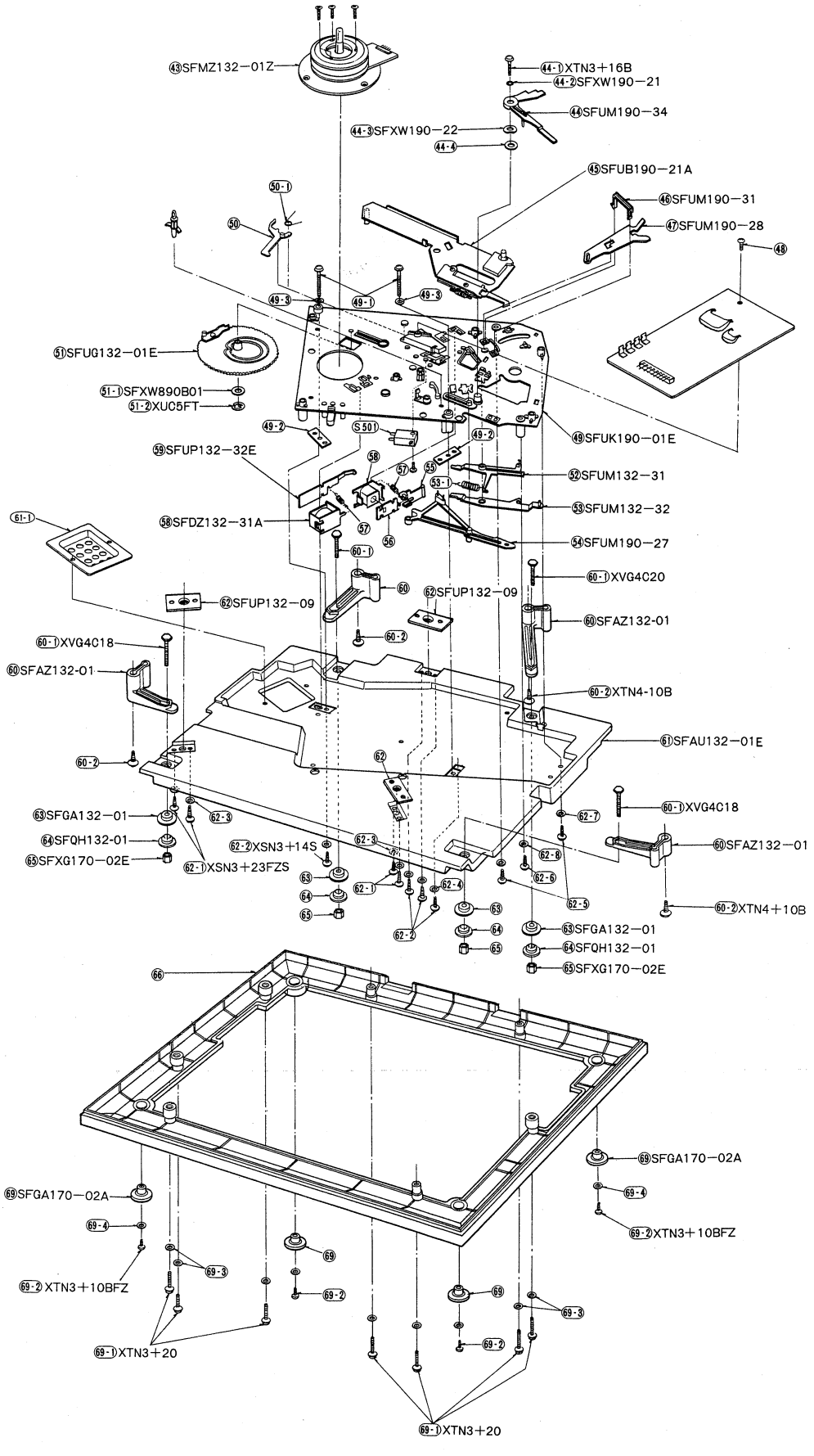


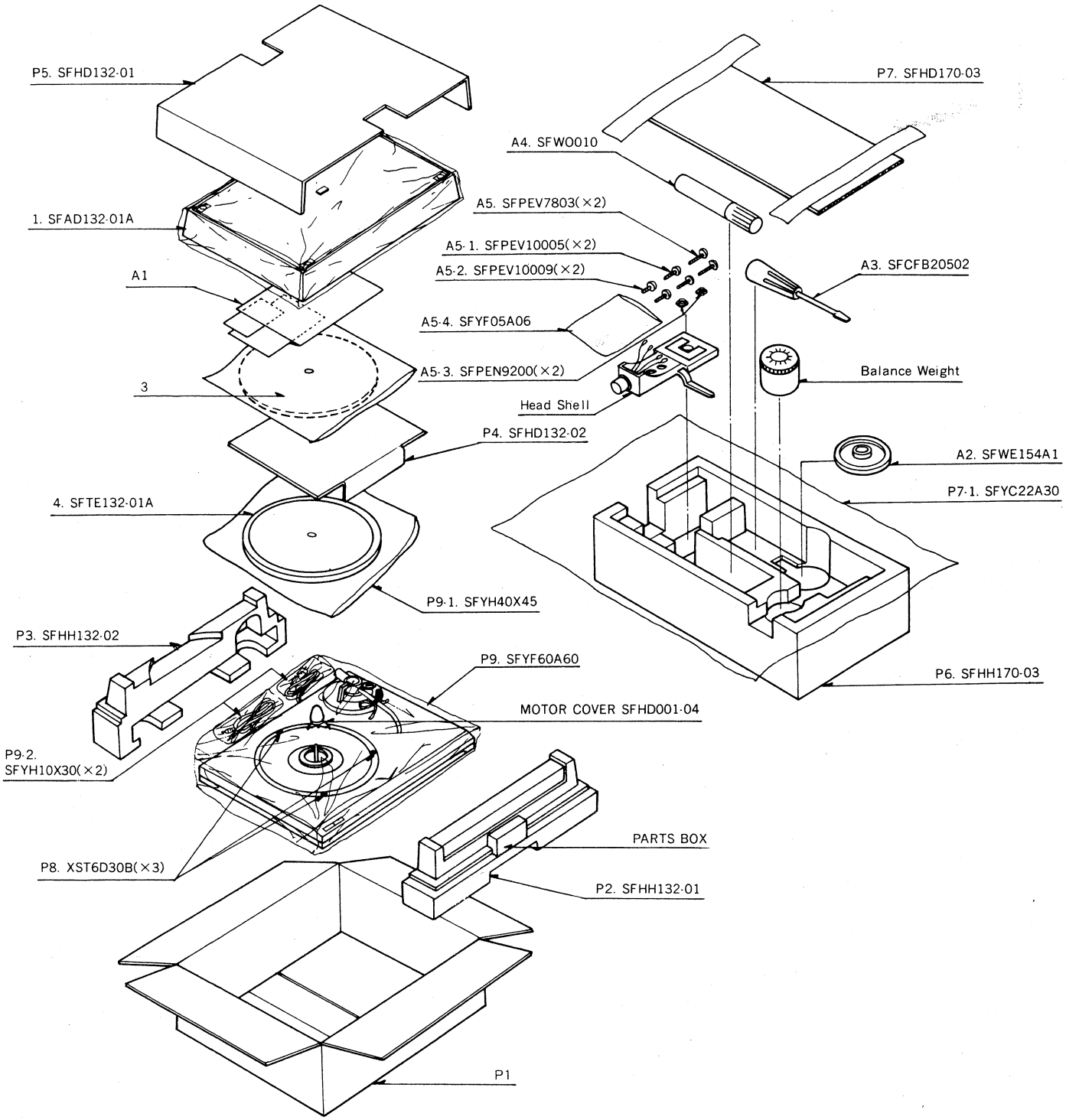
Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
42-7	**XUC3FT**	Circlip, Operation Knob	2	
42-8	**XUC25FT**	Circlip, Operation Knob	5	
43	SFMZ132-01Z	D.D. Motor Ass'y	1	O
44	SFUM190-34	Index Plate	1	
44-1	**XTN3+16B**	Screw, Index plate	1	
44-2	SFXW190-21	Washer, Index Plate	1	
44-3	SFXW190-22	Washer, Index Plate	1	
44-4	SFXW190-23	Washer, Index Plate	1	
45	SFUB190-21A	Operating Plate Ass'y	1	
46	SFUM190-31	Support, Switch Plate	1	
47	SFUM190-28	Plate, Switch	1	
48	**XTN3+8B**	Screw, P.C.B	1	
49	SFUK190-01E	Base, Automatic Mechanism	1	
49-1	**XTN4+35B**	Screw, Automatic Mechanism	2	
49-2	SFUP190-02	Bracket, Automatic Mechanism Base	2	
49-3	**XWG4**	Washer, Automatic Mechanism	2	
50	SFUM190-26	Support, Gear Setting	1	
50-1	SFQS190-21	Spring, Gear Setting Support	1	
51	SFUG132-01E	Main Gear Ass'y	1	O
51-1	SFXW890B01	Washer, Main Gear	1	
51-2	**XUC5FT**	Circlip, Main Gear	1	
52	SFUM132-31	Lever, Start Set	1	O
53	SFUM132-32	Support, Start Set Lever	1	O
53-1	SFQH130-14	Spring, Start Set Lever Support	1	
54	SFUM190-27	Lever, Switching	1	
55	SFUM132-33	Support, Solenoid	1	O
56	SFUP132-31E	Support, Solenoid	1	O
57	SFQH910-05	Spring, Solenoid	2	
58	SFDZ132-31A	Solenoid Ass'y	2	O
59	SFUP132-32E	Support, Solenoid	1	O
60	SFAZ132-01	Insulator (A)	4	O
60-1	XVG4C18	Screw, Insulator (A)	4	
60-2	**XTN4+10B**	Screw, Insulator (A)	4	
61	SFAU132-01E	Base, Main	1	O
61-1	SFUP132-01	Cover, Power Transformer	1	O
61-2	XTN3+16	Screw, Power Transformer Cover	2	
61-3	XWG3	Washer, Power Transformer Cover	2	
61-4	XWG4	Washer, Power Transformer Cover	2	
62	SFUP132-09	Bracket, Main Base	3	O
62-1	**XSN3+23FZS**	Screw, Main Base Bracket	4	
62-2	**XSN3+14S**	Screw, Main Base Bracket	4	
62-3	**XWG3**	Washer, Main Base Bracket	4	
62-4	**XWG3**	Washer, Main Base Bracket	4	
62-5	**XTN4+35B**	Screw, Main Base	2	
62-6	**XTN3+35B**	Screw, Main Base	6	
62-7	**XWG4**	Washer, Main Base	2	
62-8	**XWG3**	Washer, Main Base	6	
63	SFGA132-01	Rubber, Insulator (A)	4	O
64	SFQH132-01	Spring, Insulator (A)	4	O
65	SFXG170-02E	Nut, Insulator (A)	4	
66 [X, XAL, E, XG, XGF, AE]	SFAU132-02A	Bottom, Cover	1	O
66 [10E, 10XG, 10AXG, 10AE]	SFAU133S02A	Bottom, Cover	1	O
69	SFGA170-02A	Insulator (B)	4	
69-1	**XTN3+20**	Screw, Bottom Cover	7	
69-2	**XTN3+10BFZ**	Screw, Insulator (B)	4	
69-3	**XWG3**	Washer, Bottom Cover	7	
69-4	**XWG4**	Washer, Insulator (B)	4	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
TONE ARM and ARM BASE				
TA1	SFPWG13201K	Balance Weight Ass'y	1	O
TA2 [X, XAL, E, XG, XGF, AE]	SFPAM13201K	Tone Arm Ass'y	1	O
TA2 [10E, 10XG 10AXG, 10AE]	SFPAM13202K	Tone Arm Ass'y	1	O
TA3	SFPCC10001K	Head Shell	1	O
TA3-1 [X, XAL]	EPC205C2SK-X	Cartridge	1	O
TA3-1 [AE, 10AXG, 10AE]	EPC205C2LK-X	Cartridge	1	
TA3-2 [X, XAL, AE, 10AXG, 10AE]	SFPEV7803	Screw, Cartridge	2	
TA3-3 [X, XAL, AE, 10AXG, 10AE]	SFPEN3302	Nut, Cartridge	2	
TA3-4 [X, XAL, AE, 10AXG, 10AE]	SFPEW9601	Washer, Cartridge	2	
TA4	SFXG829-1	Screw, Tone Arm Lift Adjustment	1	
TA5	SFPRT19001K	Lift Ass'y	1	
TA5-1	SFQA829-03	Spring, Lift Ass'y	1	
TA6 [X, XAL, E, XG, XGF, AE]	SFGK132-01	Cap, Rubber	3	O
TA6 [10E, 10XG 10AXG, 10AE]	SFGK133S01	Cap, Rubber	3	O
TA7	SFPJK13202	Knob, Anti-skate Force Control	1	O
TA8 [X, XAL, E, XG, XGF, AE]	SFPKD13201	Arm Base	1	O
TA8 [10E, 10XG 10AXG, 10AE]	SFPKD13202	Arm Base	1	O
TA9	SFPZB13209	Bracket, Tone Arm	1	O
TA10	SFPEV13201	Screw, Tone Arm Bracket	1	O
TA10-1	SFPZB13211	Cover, Spring	1	O
TA10-2	SFPSP13203	Spring, Tone Arm Bracket Screw	1	O
TA10-3	SFPZB13212	Pin, Tone Arm Bracket Screw	1	O
TA10-4	SFPSP13204	Spring, Tone Arm Bracket Screw	1	O
TA11	SFPSH13201	Support, Anti-skate-Force Control	1	O
TA11-1	XWE3A7BW	Washer, Anti-skate Force Control Support	1	
TA11-2	**XTN3+5B**	Screw, Anti-Skate Force Control Support	1	
TA12	SFPJK17002	Cam, Anti-Skate Force Control	1	
TA12-1	SFPEW13005	Washer, Anti-Skate Force Control Knob	1	
TA12-2	**XTN26+5B**	Screw, Anti-Skate Force Control	1	
TA13	SFPGM20001	Rubber, Cueing Lever	1	
TA14	SFPJL13201K	Cueing Lever Ass'y	1	O
TA15	SFPZB13204	Plate, Arm Rest	1	O
TA16	SFPAB13202	Knob, Arm Lift	1	O
TA17	SFPJL13203K	Lift Bar Ass'y	1	O
TA18-2	SFPSP13201	Spring, Arm Lift Base	1	O
TA18-3	XWE4A10BW	Washer, Arm Lift Base	1	
TA18-4	**XUC3FT**	Circlip, Arm Lift Base	1	
TA19	SFPRT13201K	Arm Rest	1	O
TA20	SFPAB13203	Plate, Lift	1	O
TA21	SFPZB13208	Support, Lift	1	O
TA21-1	**XTN3+5B**	Screw, Lift Support	2	
TA22	SFPZB13205K	Support, P.C.B	1	O
TA22-1	XSN26+8S	Screw, Support	2	
TA23	SFPAB13213K	Base, Arm Lift	1	O
TA23-1	**XSN3+5S**	Screw, Arm Lift Base	2	
TA23-2	SFPSP13202	Spring	1	O

Ref. No	Part No.	Part Name & Description	Per Set		Remarks
TA23-3	**XSN3+3S**	Screw, Spring	1		
TA23-4	**XWA26B**	Washer, Arm Rest	1		
TA23-5	**XNG26BFN**	Nut, Arm Rest	1		
TA24	SFPAB13215K	PU Output Cord Ass'y	1		O
TA24-1	**XWA3B**	Washer, P.C.B. Ass'y	2		
TA24-2	**XSN3+3S**	Screw, P.C.B. Ass'y	2		
TA25	SFPAB13209A	Tone Arm Fixing Plate Ass'y	1		O
TA25-1	SFPSP00101	Spring	1		
TA25-2	SFPSP13205	Spring, Tone Arm Fixing Plate Ass'y	1		
TA25-3	**XSN3+6S**	Screw	2		
		ACCESSORIES			
A1	SFNU132X01	Instruction Book	1		O
10AE]					
A2	**SFWE154A1**	Adaptor, 45 r.p.m	1		
A3	SFCFB20502	Driver, Screw	1		
A4	SFWO010	Oil	1		
A5 [E, XG, XGF, 10E, 10XG]	SFPEV7803	Screw, Cartridge	2		
A5-1 [E, XG, XGF, 10E, 10XG]	SFPEV10005	Screw, Cartridge	2		
A5-2 [E, XG, XGF, 10E, 10XG]	SFPEV10009	Screw, Cartridge	2		
A5-3 [E, XG, XGF, 10E, 10XG]	SFPEN9200	Nut, Cartridge	2		
A5-4	SFYF05A06	Polyethylene Bag	1		
A6	SFDK100G	DIN-PIN Adaptor	1		
		PACKING PARTS			
P1 [X, XAL, E, XG, AE]	SFHP132X01	Carton	1		O
P1 [XGF]	SFHP132J01	Carton	1		O
P1 [10E, 10XG]	SFHP133S01	Carton	1		O
P1 [10AXG, 10AE]	SFHP133A01	Carton	1		O
P2	SFHH132-01	Pad, Front	1		O
P3	SFHH132-02	Pad, Rear	1		O
P4	SFHD132-02	Pad, Turntable	1		O
P5	SFHD132-01	Pad, Top	1		O
P6	SFHH170-03	Parts Box	1		
P7	SFHD170-03	Pad, Top, Parts Box	1		
P7-1	SFYC22A30	Polyethylene Cover	1		
P8	XST6D30B	Screw, Clamp	3		O
P9	SFYF60A60	Polyethylene Bag, Player Unit	1		
P9-1	SFYH40X45	Polyethylene Bag, Turntable	1		
P9-2	SFYH10X30	Polyethylene Bag, AC Cord	2		O

- The model SL-1300 MK2A(X) is available in Asia, Latin America, Middle East and Africa only.
- The model SL-1300MK2(E) is available in Scandinavia and Switzerland only.
- The model SL-1300MK2(XAL) is available in Australia only.
- The model SL-1300MK2(XG) is available in European only.
- The model SL-1300MK2(XGF) is available in France only.
- The model SL-1310MK2(E) is available in Scandinavia and Switzerland only.
- The model SL-1310MK2(XG) is available in European only.
- The model SL-1300MK2A(E) is available in Scandinavia and Switzerland only.
- The model SL-1310MK2A(XG) is available in European only.
- The model SL-1310MK2A(E) is available in Scandinavia and Switzerland only.

■ PACKINGS



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